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ABSTRACT

This report summarizes and discusses the results of the Texas Teacher Effectiveness Project, a two-year, replicated, naturalistic-correlational study of the relationships between presage and process variables with student learning product criteria at the second- and third-grade levels. Both linear and nonlinear relationships between predictor variables and the student learning gains criteria (class means averaged across four consecutive years on each of five subtests of Metropolitan Achievement Test battery) are reported. In general, the data make more sense in separate analyses for low versus high SES (socioeconomic status) schools than they do for the combined sample, and a great many significant relationships proved to be curvilinear or otherwise nonlinear. Major findings consistently contrast with findings from instruction in higher grade levels, suggesting that teaching fundamental tool skills in the early grades is fundamentally different from verbal manipulation of symbolic materials that typifies teaching at later grades, and therefore it should be conceptualized and studies separately. Additional points are detailed in the report. (Author)

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The Center's work is supported by the National Institute for Education and by the University of Texas System, as well as through contract research and development programs for public agencies.

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THE TEXAS TEACHER EFFECTIVENESS PROJECT:

Presentation of Non-linear Relationships and Summary Discussion

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Brophy, J. & Evertson, C. The Texas Teacher Effectiveness Project: Presentation of non-linear relationships and summary discussion.

The Texas Teacher Effectiveness Study has been a naturalistic investigation of the presage and process correlates of the relative success of second and third grade teachers in producing student learning gains on standardized achievement tests. The search for presage and process correlates of teachers' ability to produce student learning gains has produced weak and often conflicting results, at least until recently (Rosenshine and Furst, 1973; Dunkin and Biddle, 1974). The present study has been similar to previous work in this tradition in its underlying logic and intent, but it has introduced several methodological innovations. It was hoped that, in combination, these innovations would be more successful in identifying presage and process correlates of teacher effectiveness (defined as the relative ability to produce student learning gains on standardized achievement tests, but recognizing that this is not the only or even necessarily the best criterion) than previous studies had been.

Several of the most important innovations had to do with sample selection. A review of teacher effectiveness by Rosenshine (1970) revealed only five studies conducted over long periods of time (a semester or more) that contained any information on teacher reliability in producing student learning gains. One involved instructors teaching short courses in military topics to Air Force recruits, and two of the others involved teachers implementing an innovative curriculum. None of these seem generalizable to everyday classrooms in ordinary schools. The remaining two studies were conducted on ordinary teachers in ordinary schools, but the stability coefficients were disappointing. One study didn't give a specific coefficient but reported that stability was quite low, while the stability coefficient in the second study was .09 (Rosenshine, 1970). These data cast doubt upon the entire enterprise of searching for correlates of teacher effectiveness, since they suggested that "effectiveness" does not exist as a stable teacher variable or trait.

However, inspection of the teacher effectiveness literature revealed that the majority of studies have involved student teachers, new teachers, teachers implementing a new curriculum, or random samples of teachers which contained some unknown proportion of the types of teachers mentioned above. These teachers have in common the high probability that their classroom behavior, and thus their probable success in producing student learning gains, will be variable while they adjust to teaching in general or to teaching the particular new curriculum they are learning to teach. In short, it seemed to us that research on correlates of teacher effectiveness is handicapped from the start if the sample is not restricted to teachers who are experienced in teaching the curriculum and grade level at which they are working. After a few years of experience in a reasonably constant setting, teachers could be expected to have established a stable style or pattern of teaching, and thus to be much more appropriate as subjects in a study of the correlates of teaching effectiveness than teachers who are known to be changing their behavior or teachers who are unknown quantities with regard to this constancy vs. change dimension.

A second implication of Rosenshine's data was that teacher effectiveness might not be a stable trait, even if experienced teachers were studied. Thus, the first order of business was to collect effectiveness data on a sample of experienced teachers to find out whether or not they showed the kind of extreme instability that Rosenshine had found in the five studies he reviewed. The Texas Teacher Effectiveness Project began with this search. One hundred sixty-five second and third grade teachers, who comprised the entire teaching staff who had been working at the same grade level (either second or third) for a period of four years or more in an urban school district, were selected for study. The district administered certain subtests of the Metropolitan Achievement Tests each fall to all of the students in these grades, and these data were available in the files. Stability of teacher effectiveness was assessed by collecting the grade level equivalent scores of each student on each of the subtests included (Word Knowledge, Word Discrimination, Reading, Arithmetic Computation, and Arithmetic Reasoning), computing residual gain scores from one year to the next, and then computing mean residual gain scores for each teacher's classes across three consecutive years. The data on a fourth year were added later, when teachers were selected for observational study.

The details of the teacher selection research have been reported previously (Brophy, 1973; Veldman and Brophy, 1974). Briefly, it was found that about one-half of the subtest patterns for individual teachers showed some form of constancy (linear constancy across four years, linear gain, or linear drop), while the other half of the patterns showed erratic inconsistency. Although girls outperformed boys in the raw scores, as expected, the teachers tended to be relatively equally effective in producing learning gains in boys vs. girls. Only four of the 165 teachers showed a clearcut tendency to produce consistently better learning gains either in boys or in girls.

Also, teacher effectiveness scores tended to intercorrelate fairly highly within years across the subtests. Thus, although there were a few teachers who regularly obtained higher achievement gains in language arts than in math or vice versa, the majority of the teachers obtained similar relative student learning gains across these two subject matter areas.

There was a clearcut year or class cohort effect in the data even though residual scores were used, indicating that certain factors operating within a given year (perhaps teacher and/or student health, class leadership and cooperation, or similar factors that might make an important difference in the learning gains of the entire class within a given school year) were not eliminated even through the residualizing process (Brophy, 1973).

The obtained stability coefficients for mean gain on a given subtest from one year to the next were much higher than those noted in Rosenshine's review. Although a few were low, the great majority were between .30 and .50. Although these certainly are not high enough to justify the use of standardized achievement tests for teacher accountability purposes, they were high enough to make possible the selection from the total sample of teachers a subsample who were notably consistent across four years in the relative amounts of student learning gains that they produced across the five subtests of the Metropolitan Achievement Tests, across the two sexes, and across time (four years).

Thus, sample selection procedures for this study involved not only the restriction of the sample to teachers who were likely to have developed some consistency in their pattern of classroom teaching; they also involved selection of teachers who had already demonstrated a tendency to be relatively consistent in the kinds of student learning gains which they produced. These two factors in combination are among the more important innovations involved in this research. By selecting teachers who had shown high consistency in their measured effectiveness and who also could be expected to show relatively high consistency in their classroom process behavior, we probably increased the probability of finding meaningful and valid process-product relationships between teacher behavior and student learning, compared to earlier studies which had used student teachers, teachers starting a new curriculum, or random samples of teachers.

Procedures

This research was a two-year replicated study of the presage and process correlates of student learning gain. The design and procedural aspects of the study will be summarized briefly here, since they have been discussed in detail in several previous reports dealing with the design of the study as a whole or with the data from the first year of investigation (Brophy, 1973, 1974; Brophy and Evertson, 1973a, 1973b, 1974a; Evertson and Brophy, 1973; Peck and Veldman, 1973; Veldman and Brophy, 1974). These reports contain detailed information including copies of the instruments used and tables showing the complete data, for readers interested in this material.

Sample Selection

As noted above, the teachers included in the sample were those who had shown relative constancy in the degree of student learning gains they produced across the two sexes and the five subtests of the Metropolitan Achievement Tests, across four consecutive years of study. Thirty-one teachers were included in the first year of study. These thirty-one were the most consistent in the sample who were still teaching at the same grade level at the time the study was begun (1971-1972 school year). The second year of the study involved 28 teachers, including 19 who had been in the study the year before. Thus, the replication the second year involved 19 of the same teachers studied the first year, but it also involved nine new teachers and the elimination of 12 teachers studied previously. The majority of the teachers studied the first year who were dropped the second year were dropped because they were transferred to a new grade, although a few retired, a few went on maternity leave, and a few refused further continuation.

Data Collection Instruments

Following the advice of several critics of process-product research in teacher effectiveness, we deliberately included both low and high inference measures in assessing teacher behavior. The low inference measurement system was an expansion and adaptation of the Brophy-Good Dyadic Interaction Observation System (Brophy and Good, 1970), which is designed to record each interaction that the teacher shares with a single individual child (as opposed to lecturing or other teacher behavior that is directed at the entire class or at a group). This instrument was selected because it subsumes a wide range of variables, including most of those stressed by the observational systems that have been used most frequently in previous educational research, as well as some unique to this system. The major adaptations and expansions were done to add variables based on Kounin's (1970) research on classroom management techniques, and to break down teacher behavior more finely according to context variables concerning the time and nature of classroom interaction during which a particular observation took place. The variables will be described more fully in the results section when the process-product data from this low inference instrument are presented (the coding manual is included in Brophy and Evertson, 1973b). Teachers were observed with this instrument 4 times the first year and 14 times the second year. The first year, since the observation system was new and the observers were newly trained, observers worked in pairs and their scores were averaged. Since observer agreement was generally quite high, in the second year observers worked in pairs until they reached an 80% reliability criterion (procedures are specified in Brophy and Good, 1970, for training observers and assessing reliability), and then worked singly. Teachers were observed only 4 times during the first year of study due to financial constraints; obviously, considerations of the reliability of teacher behavior from one observational visit to the next dictate that the teachers be observed as many times as possible in order to obtain a reliable and valid index of their typical classroom behavior. This was approached much more closely in the second year of study, in which we were able to observe teachers 14 times each.

Here, each teacher was observed by two coders who alternated in visiting the classroom. Pairs of coders were assigned to a given teacher so that reliability on high inference ratings and other high inference measures could be obtained. A variety of high inference measures of teacher behavior were used. One was a set of 12 classroom observation scales based on factor analytic studies of five of the more heavily used observation systems in existence (Emmer and Peck, 1973). These were five-point scales that were rated several times during each classroom visit by the observer, and then averaged to obtain a score for each teacher. The variables were among those most heavily stressed by Flanders, Medley, Smith, and other major investigators in the development and application of classroom observation systems. Other high inference instruments included rating scales and checklists geared to get at aspects of teaching which are observable in repeated exposures to the teacher but which are difficult to measure reliably or validly through low inference observations of specific, concrete interactions. These include such variables as teacher warmth, democratic vs. authoritarian leadership style, child orientation, credibility with students, and the like. Variables such as these are not only easy to rate reliably by raters familiar with teachers; there is reason to believe that this measurement method is preferable to low inference coding when the variable is not amenable to coding of frequent discrete units of behavior (Rosenshine and Furst, 1973).

One instrument was used in a low inference manner the first year but in a high inference manner the second year. This was an instrument designed to measure aspects of teachers' lesson presentation, particularly the amounts of time (if any) devoted to various activities that teachers sometimes include in lessons. The first year these data were collected from a subsample of 10 of the teachers who were observed twice while they taught lessons. The data were collected in a low inference manner which involved actual timing of the different aspects of the lessons observed. During the second year, this low inference method was abandoned because it required separate visits to the classroom (it was not possible for coders to code with this method and code with the other low inference system at the same time, so rather than get only seven observations with each system, we decided to get 14 observations with the larger system and get the other information through high inference ratings). Consequently, in the second year, all 28 teachers involved in the study were measured on these aspects of lesson presentation, but they were measured through high inference estimates of the average amount of time that they typically spent in various activities during structured lesson times. Linear correlations between these process observation variables and student learning criteria are reported in Brophy and Evertson (1974a).

In addition to these high and low inference process measures of teaching behavior, presage data were collected from the teachers during both years of study. The first year, each teacher filled out the COMPASS battery developed by the Research and Development Center for Teacher Education (Veldman, 1972). This is a battery of pencil and paper tests designed to measure attitudes and orientations toward teaching, coping skills, defense mechanisms, personality variables, and other assorted traits and attitudes, particularly related to teaching. The battery was developed for use in diagnosing the personal needs of preservice teachers as an aid in helping to make decisions about counseling them during their preservice teaching preparation and it was used with inservice teachers in the present project to see what correlates would emerge between variables it measures and the teachers' success in producing student learning gains. These data were reported previously (Peck and Veldman, 1973).

In the second year, presage variables were collected from the 28 teachers via a questionnaire and an interview. The questionnaire contained 495 items culled from a variety of sources and measuring a great variety of variables. Included were such matters as the teacher's attitudes toward teaching, beliefs about good teaching, perceived satisfactions and dissatisfactions and their sources, leadership style preferences, process vs. product orientation, and a great many other variables. In addition, each teacher was interviewed with a 165-item interview designed to allow the teacher an opportunity to respond freely to questions dealing with opinions about classroom management, curriculum and instruction, the differential needs of different social classes and ethnic groups, and other matters. The correlations of interview and questionnaire data with student learning criteria are presented in Evertson and Brophy (1974).

During the second year the students in each teacher's class were administered the SET II test (Haak, Kleiber, and Peck, 1972), a student self-report measure designed to reveal students' perceptions of the teacher on three major dimensions: stimulating interactive style (vs. dull and uninspiring), unreasonable negativity (vs. reasonableness), and tosterance of positive self-esteem (vs. tendency to behaviors that would lower self-esteem). Although this instrument had shown good reliability and favorable indicators of validity in previous development work, unfortunately it proved to be invalid for measuring the affective perceptions of the students in the present study. The correlations obtained with it were internally conflicting and contradictory, and gave no evidence that they reflected the students' actual evaluations of their teachers. The data appeared to reflect various response sets, especially yea-saying. Consequently, data on this instrument will not be reported. Therefore, we do not have direct product data on affective criteria, although inferences can be drawn about the affective apsects of teaching from the low and high inference process observation data and from the interview and questionnaire data obtained from each of the teachers.

Data Analyses

In both years, the basic plan was to analyze the associations between presage or process measures of the teachers and the five student gain criteria (mean residual gains across four years on each of the five subtests of the Metropolitan Achievement Tests). The present report will deal with both the Pearson correlations between presage and process measures and the student gain criteria and with the results of multiple regression analyses geared to indicate presage-product and process-product non-linear relationships. It is the third and last of a set of second year reports on correlates of teacher effectiveness, and the most comprehensive. However, readers may also wish to consult the other two reports, which present linear presage-product correlations (Evertson and Brophy, 1974) and process-product correlations (Brophy and Evertson, 1974a).

In any case, the data analyses involved summing the data for each teacher across all observations. A few means were computed by dividing totals in each category by the amount of time that the teacher was observed. These means, and other percentage scores that were derived by arithmetic manipulations of raw scores, were then entered into multiple linear regression analyses of their relationships with student learning gain criteria. The high inference data were treated as follows. Each teacher, as noted above, was observed by two observers who more or less alternated their observations and therefore both became familiar with the teacher and her typical classroom behavior. At the end of the year, each of the two observers rated each teacher independently on all of the high inference measures. These measures were then summed to obtain a mean rating for the two observers, which were used as the measures for the high inference data, and interobserver reliability figures also were computed.

Results

The data to be presented in the following tables are from these low inference and high inference correlational analyses. In each case, three sets of correlations were obtained for each of the student gain criteria. One was for the total group of teachers (31 the first year and 28 the second year, or fewer, in cases where certain teachers had no data on a particular variable). The second and third sets of correlations are for low and high SES (socioeconomic status) schools. The first year, SES was taken into account by separately analyzing Title I and non-Title I schools. SES data were obtained the second year by having six administrators of the school district involved characterize the 50 elementary schools in the district on a forced-choice, seven-point scale of SES (with choices forced to approximate a normal distribution). These administrator ratings, which were done independently but showed very high agreement (_r's_ all $>$ .90), were then summed across schools to obtain a total score for each school. This score was used as the index of SES for each school, and was included in some correlational analyses that were performed for other purposes. For the present report, however, the scores in this distribution were split at the median, with 15 schools classified as high SES and 13 as low SES. In the first year there were 13 Title I classrooms. Correlational analyses within the two social class groups were then performed in addition to the correlational analyses for the total sample of teachers, because the first year's data showed that there were many contrasting patterns in the kinds of teaching that appeared to be optimal in these two different types of schools.

For convenience, the data will be presented in sets clustered together because they are derived from the same measurement instrument or set of instruments. Integration of the data from different data sets will be reserved for the discussion section, for the most part.

Key to Interpretation of Tables

Construction of the tables for this report presented formidable conceptualization and communication problems. Decisions had to be made about how much information to include, about the format of the tables themselves, and about how to handle situations where only a few subjects were available for analysis.

Decisions about what to include were made easier by the fact that this report has been preceded by two earlier ones (Brophy & Evertson, 1974a; Evertson & Brophy, 1974) dealing with the linear correlations between process and product measures and between presage and product measures, respectively. These reports contain the full data on linear correlations for all analyses where six or more subjects had valid data available for analysis, along with the relevant inter-coder agreement data for each process variable. Thus, the decision was made to eliminate these data from the present report, except for including linear correlation coefficients which were statistically significant when no curvilinear analyses were statistically significant, and also including the correlation coefficients to indicate the strength of relationships when the non-linear analyses revealed a different linear relationship in each of the two SES groups.

The logic for these decisions is as follows:

1. Inclusion of all of the linear correlation coefficients and the inter-coder agreement data would be redundant with the previous reports and would clutter already overcrowded tables.

2. The cutoff figure of six subjects with varying scores was chosen arbitrarily. Whenever data for the entire sample or (more typically) for one of the two SES subsamples contained five or fewer subjects with any data at all or only five or fewer subjects with scores different from the scores of the rest of the subjects, the data were disregarded and treated as "no data." The first case is a total "no data" situation, meaning that fewer than 6 subjects in the group of interest had data on the variable (many of the behavioral process observation variables were contingent upon contextual situations which may

or may not have occurred in a given classroom, so that certain of them were scored for only a few teachers because these situations came up in only a few classrooms). In these cases, most of the teachers had no data on the variable because the situation involved in coding it never arose during observations in that classroom. The second case mentioned above occurred when many teachers had data but a majority had the same score (usually "0"). In these situations, the "0" scores of the teachers were real, but the distribution was an extreme J-curve, with all but a few teachers having "0" scores. Under the circumstances, it seemed better to enter "no data" on the table rather than to report findings from such an unusual and obviously misleading analysis. Thus, in all three of the reports relating presage and process measures to product measures, "no data" appears on the table both in cases where fewer than 6 teachers had usable data and in cases where more than 6 had usable data but fewer than 6 had scores which differed from the modal scores (usually "0").

3. The data for non-linear relationships come from a series of step-wise curve fitting regression analyses which tested the following hypotheses in sequential order: A) The relationship between the presage or process variable and the product variable is curvilinear in both SES groups but different for each group; B) The relationship is curvilinear in both groups and both groups share the same curve; C) The relationship is linear in both groups but each group has a different linear relationship. If none of these three tests was statistically significant, the zero-order correlation coefficients for each of the two SES groups were used.

4. A probability level of .10 was selected as the cutoff point for statistical significance. The decision to use this figure rather than the more

typical .05 level was made because the study deliberately included "anything" which might relate to student learning gains, including many variables thought to be marginally likely to succeed at best. Also, some of the variables were in sets with ipsative relationships to one another, so that high figures in one or two of the categories meant that the other categories would have no data or such little data that significant relationships would be very unlikely. Also, Cohen's (1969) investigations of the relationships between the power of statistical tests and sample size indicate that correlations which are significant but moderate rather than very high (as would be expected in the present investigation) are especially likely to be missed when the sample size is small. In short, the danger of missing a correlation that actually is significant (a false negative) is greater in such studies than the danger of false positive errors which make it appear that a relationship which actually doesn't exist is significant. The latter danger was further reduced in this study by the fact that many of the variables were measured separately in different contexts and with both high and low inference measures, so that it is usually possible to assess whether or not a given finding holds up across a range of contextual and measurement variations. Finally, this research was essentially an emperical, hypothesis generating study rather than a hypothesis testing study, so that we were more concerned with the danger of missing a hypothesis worth following up than with turning up a few false positives. We believe these arguments to be persuasive, but readers should bear in mind that a cut-off of .10 was used in determining statistical significance. However, relationships which reach the .05 level of significance are indicated in the tables.

5. Readers should also look upon the probability values from our analyses as general indicators of the strength of relationships and not as exact probability estimates. This is because the study violates several of the assumptions underlying the use of such probability coefficients. The most serious and obvious problem is that several hundred relationships were tested both in year 1 and year 2, but there were only 31 subjects in year 1 and 28 in year 2. Thus, there were many more variables than subjects, instead of the opposite, as is recommended. This problem was due to financial and practical considerations and to our desire to include "anything" that might prove to be important, rather than to any questioning or rejection of the usual reasons given for exercising caution in interpreting relationships where the number of variables exceeds the number of subjects.

6. The tables are arranged in quadrants, with one set of quadrants depicting the relationships between each presage or process variable and each product variable. The two left side quadrants are for low SES classrooms and the two right side quadrants are for high SES classrooms. Within these, the top quadrant is for presentation of correlation coefficients and the bottom quadrant is for graphic depiction of the relationships among the variables when one of the three statistical tests from the curve fitting regression analyses mentioned above reached statistical significance. The graphic depictions in the bottom quadrants have been very carefully drawn in an effort to reproduce faithfully the exact angles of straight lines and the precise form of curved lines.

7. A multiple _R_ appears below the quadrant, except where no data were available and therefore "ND" appears instead. This multiple _R_ represents the

percentage of product criterion variance accounted for by the presage or process measure for the total group (low SES and high SES combined). If none of the curve fitting regression tests reached statistical significance, this multiple R corresponds to the square of the zero-order correlation between the presage or process variable and the product criterion variable. If one of the curve fitting regression tests did reach statistical significance (using the .10 cutoff criterion), the multiple R is from this test. If the R is from the first test (indicating that the relationship was non-linear in both groups but that the non-linear relationships differed), it reflects the percentage of criterion variance accounted for using a regression model predicting contrasting non-linear relationships in the two subgroups. However, if the R appears when one of the other two relationships is graphed (common curvilinear slopes or contrasting linear slopes, respectively), it results from a step-down analysis in which the associated probability value comes from a test of the significance of increase in multiple R when one moves from one model to the next. Thus, in each case, the multiple R reflects the percentage of criterion variance accounted for when the model which reached the statistical significance criterion is used. However, in the case of multiple R's accompanying the second model (common curvilinear slope) or the third model (contrasting linear relationships), the p-value attached to this multiple R will reflect the significance of the increase due to the shift from the earlier model to the later one, rather than the significance of the model itself used in isolation as a prediction in an independent test rather than as part of a step-down series.

8. Occasionally more than one of the regression models and/or the zero-order correlation coefficients would surpass the statistical significance criterion,

causing a problem of choice among statistics to present. In such situations, the first model to reach statistical significance is presented, even if a later model had a lower probability value. This is because the models are entered in order of specificity, and theoretically the earliest model to reach the statistical significance criterion represents the best fit between the two variables, regardless of the significance levels of tests of models later in the series. Therefore, lines or curves from the step-down regression analyses are presented whenever these were significant, even if the zero-order correlations were also significant. However, if the significant test was the third test reflecting different linear slopes in the two SES populations, the zero-order correlation coefficients are presented in the upper quadrants in addition to the lines presented in the lower quadrants, to provide additional information to readers about the relative strength of the relationships. It should be kept in mind, however, that the multiple R below the quadrant reflects the significance of the addition to the variance accounted for when the switch was made from the second model to the third model in the regression analyses, and is not the square of the correlation between the variables for the total group.

9. In summary, then, the quadrants will contain one of four kinds of data in the simple case: different curves for each group in the lower quadrants (indicating that the first test was significant); common curves in the lower quadrants for each group (indicating that the second test was significant); contrasting straight lines in the lower quadrants for each group accompanied by correlation coefficients in the upper quadrants (indicating that the third test was significant); or nothing in the lower quadrants and correlation coefficients in the upper quadrants (indicating that none of the regression

models was significant, so that the zero-order correlation coefficients are presented). Multiple R's will be presented beneath each quadrant for each analysis, although the specific meaning of the p-values associated with these multiple R's will differ somewhat depending upon which (if any) of the models or analyses yielded significant relationships.

10. In the case where insufficient data were available for analysis because fewer than 6 teachers in the whole group or in the subset had data at all or had data differing from the modal score, the notation "ND" will appear in the quadrant. In the most extreme case, where fewer than 6 teachers had available data for the entire sample, "ND" will appear in all 4 quadrants and also directly under the quadrants where the multiple R usually appears. If neither subgroup (low nor high SES) had enough teachers for analysis but the combination of the two did have enough, "ND" will appear in each of the 4 quadrants but a figure for the multiple R will appear below the quadrants. This will be the square of the zero-order correlation coefficient for the total group, which appears in Brophy & Evertson (1974a). Very few of these are statistically significant, of course, because of the low N's involved.

11. A more complex case of missing data occurs when there were enough data to analyze for one of the SES subgroups but not for the other. In this case, "ND" will appear in the two left quadrants if there were insufficient data for analysis in the low SES subgroup, or it will appear in the two right quadrants if there were insufficient data for analysis in the high SES subgroup. Usually the low N problem in these situations caused the curve fitting tests to fail to reach significance, although occasionally a test involving a group with 6 or more usable scores in one SES set but fewer than 6 in the other SES

set would yield a significant result. In this case, the curve is drawn in on the side of the quadrant that is reflective of the group that had sufficient data, but the corresponding curve for the other group has been deleted and the notation "ND" appears instead. This procedure reflects the decision that it would be better to present no data at all in situations where N was very low and data were suspect than to present suspect and probably misleading data. The multiple R's are labeled as significant in these situations, although these, too, are suspect in view of the nature of the analysis. Given our general finding that the data usually have to be interpreted by SES because the relationships between presage and process variables and student outcome criteria are more often different than similar for these two groups, we believe that the safest and most sensible way to view these unusual analyses is to ignore the data for total group and for the group which had insufficient N to allow analyses, and to interpret only the data for the group which did have sufficient data for analyses (assuming that it is interpretable; see below).

12. The graphic depictions may at first appear confusing in some cases where the second test was significant (indicating that a common curve depicted the relationship between the variables in each SES group). This is usually taken to mean that an identical or very similar curve will appear for each group, and in many cases this is what does appear. However, the test assesses whether or not the two groups appear on a common curve, and not whether or not they appear on the same place on that curve. Therefore, sometimes a test of a significant common curve yielded strikingly different graphic depictions of the relationships. This appeared when the relationship for the entire group was curvilinear, but the data for one SES group was on the left half of the

curve and the data for the second SES group was on the right half of the curve. In cases like these, the direction of the relationships for the two groups is opposite, and is similar to the situation for the following test indicating contrasting linear relationships, except that the relationships tend to become soemwhat curvilinear. In short, occasionally the test of a common curve was significant but the relationships between presage or process variables and student outcome criterion variables were quite different for the two groups, with one group being on the dropping portion of the curve indicating a generally negative relationship and the other group being on the rising portion of the curve indicating a generally positive relationship. This problem, along with our desire to indicate the best fit relationships as precisely as possible rather than use less exact zero-order correlation coefficients (in cases where the curve-fitting regression tests were significant), led us to the decision to depict graphically the relationships whenever the curve fitting tests yielded significant results. Consequently, where curves appear in either or both of the lower quadrants, these represent the graphic depiction of the best fit between the two variables. Some of these graphic depictions are quite easily interpretable, but some are not. This problem will be discussed in the following section.

Rules for Interpreting Graphic Depictions

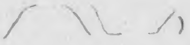
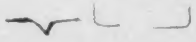
In addition to the decisions described above concerning what data to present and how to present it, decisions had to be made about how to interpret some of the curves that appeared in the curve fitting regression analyses when one of the three tests reached statistical significance. Unless otherwise noted, the interpretation of the data in the following text is based upon the following decision rules.

A. Curves - If either of the first two tests were significant, curves depicting the relationship between the variables within each SES group appear in the two lower quadrants. Interpretation for some of these curves is straightforward and obvious, but for others it is questionable or even impossible. The major types of curves are listed below, along with the interpretation given for each and the rationale given for this interpretation. It should be noted, however, that these curves are ideal types, whereas the actual curves to be found in the tables include all of the possible segments that can be found on a U-shaped or an inverted U-shaped curve, and thus include many curves which are in between some of the extreme ideal types discussed below. In these cases, interpretation will be less clearcut than it will be when the curves are more idealized.

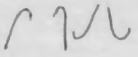
1. Inverted U-shaped curves. These curves depict a relationship in which some medium or optimal amount of the presage or process variable is associated with highest scores on the product criterion variable, with either too little or too much of the presage or process variable being less desirable than the medium optimal amount. This interpretation is straightforward, although the strength of the relationship depends upon the steepness of the curve. Occasionally an inverted U curve will appear which is clearly recognizable as such but which is so shallow that is is virtually a flat line and thus uninterpretable.

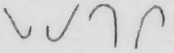
2. Decelerating curves. Many curves are decelerating curves which rise or fall for a while and then trail off, becoming virtually horizontal at one end. These curves indicate that the presage or process variable is related to the product criterion only at one of the extremes. For example, a decelerating

curve which rises but then tails off as a near-horizontal line moving to the right, would indicate that teachers who were very low on the presage or process variable tended to get low student gains on the criterion measure, but that teachers very high on the presage or process variable did not get any better gains than teachers who were more medium on it. In other words, curves like these represent threshold relationships, in which increases in presage or process variables are associated with increases in student learning gains up to some point, but beyond that point further increases in the presage or process variables do not lead to further increases in the criterion variables. Decelerating curves which fall rather than rise have the same kind of threshold relationship, except that the relationship is negative rather than positive for part of the curve that is dropping (before it trails off into a horizontal line).

The nature of these decelerating curves varies considerably, and affects interpretation. Some () are essentially minor variations of linear relationships, indicating a generally positive or negative relationship between the two variables which tails off at one extreme of the presage or process variable. These relationships are quite strong and easily interpretable. In contrast, another kind of decelerating curve () indicates that there is essentially no relationship between the variables for most levels of scores on the presage or process variable, with the exception that extreme scores on one end tend to be associated with higher or lower student learning gains. Interpretation here is somewhat different. In the case mentioned above, the basic interpretation is that the two variables are related in an almost linear fashion except at one extreme. In the present case, the interpretation is that the variables are essentially unrelated except at one extreme.

Decelerating curves which lie between these extreme examples will be interpreted congruently with the interpretations given above. That is, a relationship between the two variables will be interpreted to the extent that significant portions of the curve angle upward or downward from the horizontal. Conversely, to the extent that significant portions of the curve lie on or near the horizontal, the interpretation will be that a relationship between the variables exists only at one extreme of the presage or process variable.

3. "Candy cane" curves. A variation of the decelerating curves mentioned above are "candy cane" curves which not only decelerate and become horizontal but also hook back up or down again to some degree. Here again, the precise interpretation will depend upon the precise nature of the curve. Where the portion of the curve which hooks back again from the horizontal is very small () so that the curve closely represents the type mentioned in section 2 above, the interpretation will be similar. That is, the slight hooking back will be ignored and will be treated as if it decelerated into a horizontal line.

In contrast, in situations where one side of the curve is definitely longer than the other but nevertheless the shorter side clearly hooks significantly away from the apex (), interpretation is more arbitrary. The problem here is that any of several different things might be going on. One possibility is that the variable is essentially linearly related to the criterion, but that there are exceptions in some classrooms for some unknown reasons. A related interpretation is that the variable is actually complex and multidimensional and/or that it is affected by contextual factors, so that a curve of this type is obtained when more refined measuring techniques might have produced simpler and more interpretable relationships. Other explanations for the appearance of such curves are also possible.

In any case, when such curves appear, only the extremes on the long parts of the curves will be interpreted. Regardless of the reasons for the relationship, when such curves appear it still can be said that teachers who are extremely high or extremely low (depending upon the curve) on the presage or process variable involved tend to get higher or lower student learning gains. In short, in these situations we will interpret only the extreme end of the curve, treating the rest as if it were a flat line.

4. U-shaped curves. U-shaped curves appear to be inherently uninterpretable, at least not without other information about how a variable might be interacting with other variables. Such curves indicate that teachers who are either low or high on the variable tend to produce greater student learning gains than teachers who are in between. With only a very few exceptions, relationships of this sort make little psychological sense. Many of the U-shaped curves are extremely shallow and will be ignored anyway, treated as if they were essentially flat horizontal lines. However, some steep U-shaped curves were obtained. These will be reported but usually not interpreted, unless we were able to discover a psychologically meaningful (i.e., face valid) reason why such a relationship should appear. Usually such relationships appear because the presage or process variable is multidimensional and/or interacts with context effects, so that different scores for different teachers do not reflect precisely the same behavior. Another possibility is that the variable interacts in some complex way with some other variable. We will check for such complex relationships later, but for the present, U-shaped curves will be left uninterpreted for the most part.

B. Straight Lines - Straight lines resulting from significant multiple R's from the third test (contrasting linear relationships) will be interpreted much like correlation coefficients. The lines indicate a linear relationship between the presage or process variable and the criterion variable, with the strength and importance of the relationship being dependent upon the angle of the line. Sharp rising or dropping lines indicate a strong and interpretable relationship, while horizontal or near-horizontal lines indicate no significant relationship. The latter frequently appear, because the tests for contrasting linear relationships frequently indicated a strong linear relationship in one group and essentially no relationship in the other. In any case, straight lines will be interpreted as linear relationships, with their strength and importance dependent upon the angle of the line, just as the strength and importance of correlation coefficients are dependent upon the size of the coefficient.

Data Presentation

For convenience, data will be presented in clusters according to the measurement instruments used to collect them. High and low inference measures of interaction process variables will be presented first, followed by questionnaire and interview presage measures. Variables will be discussed briefly as they are presented, and the concluding discussion section will present more broad ranging and integrative discussion of the results for the project as a whole.

For each variable, except where data were missing altogether or were too sparse to warrant presentation, information about it's relationship with each of the five student learning gain criteria is presented in the four quadrants discussed previously. Data for low SES schools are presented in the two left quadrants, with correlation coefficients in the top quadrant and/or graphic depictions of relationships in the bottom quadrant. Data for the high SES schools are presented in the two right quadrants, with correlation coefficients presented in the upper quadrant and/or graphic depictions of relationships presented in the lower quadrants. A multiple R representing the proportion of criterion variance accounted for by the presage or process variable for the total sample of teachers (N = 31 for year 1 and N = 28 for year 2) appears below the quadrant.

Although data for both years are separated for low and high SES schools, the separation criteria were slightly different. The first year, data for Title I schools (schools populated by low income families primarily) were presented separately from data from non-Title I schools. There were 13 classrooms in Title I schools and 18 classrooms in non-Title I schools among the total of 31 classrooms. In the second year, schools were split at the median on a composite SES score obtained by having several school administrators from the district rank the schools on SES and then averaging these ranks (which correlated very highly with one another). This split for the second year yielded 13 low SES classrooms and 15 high SES classrooms.

The five student learning gains criteria are average mean residual gains across 4 consecutive years (classes) for each teacher on 5 subtests of the Metropolitan Achievement Tests (word knowledge, word discrimination, reading, arithmetic computation, and arithmetic reasoning). Since the teachers had been selected on the basis of their consistency in producing student learning gains on these tests, the average across the 4 years for which data were available was considered the best estimate of teacher effectiveness in producing student learning gains.

Readers should bear in mind that the data apply only to a measure of success in producing student learning gains, and not to any measures of success in the affective area. This is mentioned not only because it is important in its own right, but because many of our data suggest that some of the success that teachers attain in producing learning gains (especially in high SES schools) may come at the expense of affective gains. This has been discussed in some detail in a previous report (Brophy & Evertson, 1974a), and it will be further elaborated here. Attempts to collect affective data via a student self-report instrument were unsuccessful and presented validity problems as mentioned previously.

Given that data from the curve fitting analyses take precedence over zero-order correlation coefficients, the present report in a sense supplants (although in effect it really only expands) the previous report (Brophy & Evertson, 1974a). In most cases, significant correlation coefficients that appeared and were discussed in that report remain in the present one, although in a few cases they have been supplanted by graphic depictions of relationships because one of the curve fitting regression analyses yielded a significant result. More typically, however, the correlation coefficients in the previous report are supplemented by additional non-linear relationships in the present report. In any case, the present report is the more complete and definitive, although readers interested in some of the fine points of the data might wish to consult previous reports.

Finally, it should be noted that distinctions among the 5 student learning criterion variables are rarely made, even though they represent 5 different tests which group into two different major areas (language arts and mathematics, respectively. Thus, the report sheds little light on differential teacher behavior which relates to student learning in these different curriculum areas.

No doubt, this is partially or wholly due to the fact that our teachers were selected because of their general consistency in producing student learning gains across all five of the subtests. Given this sample, the chances of finding particular clusters of teacher variables related to particular student tests were drastically reduced. Thus, the present findings do not necessarily imply that teacher behavior will not show more differentiated and specific relationships to learning in different curriculum areas in studies using random samples of teachers. However, it should also be noted that our original data on 165 teachers revealed very few who consistently achieved greater success in language arts than in math or vice versa. Thus, these data suggested that, at the early grades at least, teacher success in producing student learning gains tends to be rather general across subtests. Even the teachers who were inconsistent across years tended to be consistent within years. That is, in a "good" year they tended to have relatively high mean residual gain scores across all subtests, while in "bad" years they tended to have relatively poor mean residual gain scores across all subtests. Only a handful of teachers consistently did better or worse on particular subtests or on language arts vs. math across the four years. In any case, in presenting and discussing the results we will typically refer to teacher success in producing learning gains as a single general variable, even though 5 separate learning criteria were used. This is a simplification, but it holds for the most part.

A final general point to bear in mind in reading the data is that they make much more sense when considered separately for low and high SES groups than they do when considered for the total group. This is one of the major findings of our study, indicating that the kind of teaching that produces the best learning gains in high SES schools differs systematically from the kind of teaching that produces the best learning gains in the same grades in low SES schools. To the extent that SES primarily reflects differences in the abilities or levels of cognitive maturity of the students involved, these data constitute in effect a broad set of aptitude-treatment interaction hypotheses and help point the way toward more prescriptive advice about teaching particular types of students, as opposed to the more typical tendency to present particular teaching techniques or characteristics as good or bad for all students and in all contexts. We will return to this point frequently during the presentation of the data and the discussion. In any case, it is the rule rather than the exception that the relationships between presage and process variables and student learning gain criteria hold for one but not both of the two SES groups.

Classroom Observation Scales

The data in Table 1 are from 12 high inference ratings developed by Emmer and Peck (1973) from factor analyses of five heavily used observation systems. These 12 variables are among those used most often in process observation systems developed for the classroom, and perhaps the most important finding concerning them is the general absence of significant correlation coefficients. The picture changes somewhat when the non-linear analyses are added, because significant relationships become more frequent. Even so, however, the frequency and strength of relationships for these 12 variables were rather low considering the importance given to them in the literature.

Student attention was generally positively associated with learning, as expected, although the relationships were weak and often curvilinear. The apparent reason for this is that although apparent student attention can be rated reliably by classroom observers, it does not appear to be a very valid measure of actual student attention as assessed by student self-report or measures of student ability to remember what was going on in an earlier class (Taylor, 1968). The curves for this variable indicate that observable and ratable student attention is reliably associated with learning only at the negative end. That is, classrooms where attention is notably poor tend to yield poor student learning, but beyond this, observable student attention does not relate reliably to measured student learning.

The second measure concerned the frequency with which teachers posed questions to the class (one aspect of discussion-oriented indirect teaching). This measure had no significant linear relationships with learning, and the non-linear relationships indicated that relationships with learning were generally weak. The only notable relationship occurred for high SES classrooms featuring high frequencies of such questions, which were associated with high student learning gains. This is the first of a number of findings in our study to the effect that indirect teaching methods are ineffective (sometimes contraindicated and sometimes merely unimportant) in low SES schools and of only weak importance in high SES schools. We believe that these findings do not invalidate the earlier work supporting the methods of indirect teaching; instead, we believe that they reflect the nature of interaction at the early grade levels. At these grades, the students, particularly those from low SES schools, are mastering fundamental tool skills. Teaching and learning these kinds of skills requires teacher-structured lessons and much time devoted to physical practice of skills and opportunities for feedback. The variables of indirect teaching, which largely concern verbal interaction between teachers and students, are less relevant at these grade levels, although they become more relevant as the children move away from learning tool skills and into more verbally oriented interactions.

The measure of teacher task orientation showed a few correlations in the expected (positive) direction, but these were relatively few compared to expectations based upon past research. The data in general suggest that this variable was more important for low than for high SES, and the curvilinear data are mostly uninterpretable curves which approach being flat horizontal lines. Thus, in general, the variable of teacher task orientation which is important at higher levels appears to be relatively unimportant at these early grades. This relative unimportance is surprising, not only in view of earlier research on the variable itself, but also because other data from the present study indicate the importance of those teacher variables stressed by Kounin (1970) which help maintain student engagement in relevant tasks and avoid the inactivity which breeds control problems. The latter is particularly puzzling. The fact that the variable did not prove important despite previous research on older populations might be explained by the ages of the children in these grades. Perhaps young children have not yet developed a sense of organization and a sensitivity to wasting time to the point that they would notice and become irritated by such behaviors in a teacher the way older students usually will.

The next variable concerns frequent pupil-to-pupil interaction. Like the data on the frequency of teacher questions (and thus the frequency of discussions), the present data reveal little support for the importance of indirect teaching at these grade levels. The data for low SES are conflicting, showing a single positive correlation for year 1 but negative correlations for year 2. The data for high SES schools also conflict, showing no significant findings for year 1, a significant negative correlation for reading group interaction in year 2, but some generally rising curves for whole class activities in year 2. Thus, although frequent pupil-to-pupil interaction may be a good thing at higher grade levels, it appears to be unimportant and perhaps even maladaptive for teaching at the early grades. The only support for it in our study comes from general class discussions (not reading groups) in high SES schools from the second year of the study, and even here the curves are such that only the classes that were very high on this variable showed higher learning gains.

The next variable deals with the percentage of teacher time devoted to lecturing and demonstrating (as opposed to questions and discussions and to allowing children to practice skills and receive feedback). The first year data showed weak positive relationships for high SES. The second year data showed consistent and somewhat strong negative relationships for low SES and mixed and weak findings for high SES. Again, this is another example of weak and conflicting data for a variable connected with the concept of indirect teaching, and it again shows that such teaching appears to be unimportant at these grade levels. The negative correlations in low SES do not indicate support for indirect teaching, because, as will be noted later, the data suggest that in lieu of lecture and demonstration in low SES schools, the children needed practice and feedback as opposed to questioning and opportunities for discussion.

The data on teacher negative affect expressed toward the children showed remarkably few significant relationships. It was expected that this variable would consistently correlate negatively with student learning gains, but this was not the case. There was a slight negative trend in low SES and a slight positive trend in high SES, but none of the relationships were particularly strong or noteworthy.

The data for positive affect mirror those for negative affect in many ways, except that several significant relationships were found. Positive affect was associated positively with learning gains in the low SES schools, but mostly negatively in the high SES schools. Taken together, these two variables are the first evidence of a pattern that is repeated again in many different measures from our study, to the effect that the more successful teachers in low SES schools were warm and encouraging towards the children while the more successful teachers in high SES schools were demanding and critical.

It should be noted that the high SES data do not conflict with previous findings to the effect that learning is reduced under conditions of pressure, frustration, and negative affect. Although the relative differences among the high SES teachers indicated that the teachers who showed relatively more negative affect tended to produce higher learning gains than those who showed relatively less, the absolute scores on measures of both positive and negative affect indicate that the affect shown was overwhelmingly positive. Thus, the teachers high on negative affect in the relative sense were not showing much negative affect in any absolute sense. Careful examination of the data suggests that much of the negative affect came in the form of expressions of displeasure or criticism when students failed to respond to questions or otherwise to meet teacher expectations. Thus, it came in the form of a somewhat critical demandingness restricted mostly to the issue of student ability to meet teacher achievement demands, and was not a more general negative affect characterized by such indices as punitiveness, hostility, or a rejecting attitude towards the children.

Even though the absolute frequency of negative affect was low, its importance should not be minimized, however. The relationships between affect measures and student learning gains were quite consistent and striking, including the consistent difference between low and high SES schools. Thus, even though relatively small differences are involved in the absolute sense, it appears that successful teachers in low SES schools avoided negative affect and motivated through encouragement and other positive methods, while the more successful teachers in high SES schools tended to motivate more through challenge and chiding criticism.

The next variable deals with the degree to which the teacher asked questions and gave assignments which required high levels of generalization, inference, or explanation. No significant relationships of any kind appeared in year 1 for this variable, although several appeared for year 2. These indicated that a relatively high level of generalization in questioning was positively associated with learning in high SES schools, although there was only one significant linear correlation and most of the relationships were curvilinear. The data for low SES schools were mixed. In general, these findings fit in with a larger pattern found across several measures in the study suggesting that the high SES students profited from being challenged with difficult material, but that the low SES students did not (in fact, sometimes they did better by being taught less but having this lesser amount taught more thoroughly).

The next variable deals with observer ratings of student withdrawal, passivity, or aimless behavior in the classroom. This variable showed the expected negative correlations, although they were much stronger for high SES than for low SES classrooms. The reasons why the findings were not more widespread or stronger are probably similar to those mentioned above for observed student attention. That is, observed student behavior of this type is suggestive but not necessarily conclusive of an absence of student involvement in learning or mastery of the tasks. The fact that the findings were a little more consistent than those for student attention is probably due to the fact that behavior of this sort is a somewhat more positive and clearcut indicator of absence of student involvement than is apparent lack of attention. Also, this variable has connotations of poor motivation or even helplessness on the part of students, whereas simple inattention does not (inattention may indicate weak motivation for learning or a tendency toward distractability or hyperactivity, but it does not necessarily connote despair or withdrawal from the learning situation).

The ratings of teacher clarity showed no significant associations for year 1, but showed primarily positive associations, as expected, for year 2. This was especially notable in the low SES classrooms. The latter finding is one of many indicating that the low SES students, who had both less general ability and fewer school-relevant experiences compared to the high SES students, were more dependent upon the teacher for their learning and less able to learn on their own or from one another. Consequently, variables such as teacher clarity were particularly important in the low SES group. The more general principle here would seem to be that the importance of teacher clarity will vary with the ability of the student to learn on his own, with teacher clarity being increasingly important to the extent that the student who lacks this ability and is thus more dependent upon the teacher.

The ratings for teacher enthusiasm also showed no singificant findings in year 1 but a pattern of significant relationships in year 2. The data for low SES schools revealed a generally positive pattern, as expected. However, the data for high SES schools were mixed, instead of positive as expected. Based upon the data as a whole and upon the comments of our classroom observers, we interpret this finding as follows. For low SES schools, these data are part of a general pattern suggesting that the more successful teachers were warm, encouraging, enthusiastic, and otherwise generally positive and student oriented in their approach to teaching. For high SES schools, however, the situation was considerably different. First, positive teacher affect variables were relatively unimportant in these schools, with the findings typically being either non-significant or mixed in direction. Second, our classroom observers suggested that the teachers rated highest on this variable did not have the complex of generally desirable qualities that the term "enthusiasm" usually connotes in educational research. When this variable has been included in studies done at higher grade levels, teachers rated as enthusiastic are usually described as animated, theatrical, and talented in "bringing the subject matter alive" to their students through a combination of techniques including student involvement and teacher modeling of interest and excitement in the topic. Although these qualities were present in some degree in teachers rated high on "enthusiasm" in our study, the observers indicated that the teachers rated extremely high in "enthusiasm" tended to show somewhat less desirable qualities which might be more prevalent at the early elementary grades: gushiness and a generally melodramatic but unconvincing manner. This was especially true of the teachers rated high on "enthusiasm" in the high SES schools. Thus, the negative correlations in the high SES schools on this variable may reflect an overdone gushiness rather than a more reasonable and genuine enthusiasm.

The next variable concerns the frequency of convergent questioning vs. divergent questioning. Again, there were no significant findings for year 1, nor were there any significant findings for the total group data for year 2. However, several curivlinear analyses revealed significant findings for the reading group and general class data in year 2. These analyses, although mixed, indicated a generally negative relationship in low SES and a generally positive relationship in high SES, but with the nature of the relationships being somewhat weak and tending to be curvilinear. Interpretation of this variable is further compounded by the fact that the most obviously interpretable data occurred for reading group process measures correlated with mathematics gains, relationships which are inherently uninterpretable. Thus, perhaps the most conservative and appropriate general conclusion here is that this dimension is not important to student learning at these grade levels. This is another part of the general pattern to the effect that indirect teaching and the concepts associated with it appear to be of little importance to instruction in the early elementary grades, because teaching in these grades has not yet begun to concentrate on the verbal interchanges between teachers and the class as a whole which characterize education at higher levels. Since general class discussion is a relatively infrequent and unimportant aspect of instruction in the early elementary grades, aspects of indirect teaching and other classroom interaction variables which are closely connected with the activity of general class discussion are necessarily unimportant also. This does not mean, however, that they are unimportant at later grades where discussion is a frequent if not predominant mode of instruction.

Although the non-linear analyses added several significant relationships which did not appear in the correlational analyses, the general conclusion that the variables included in this set of classroom observation scales were relatively unimportant and unrelated to student learning remains true. Despite the heavy emphasis on these variables and their popularity in teacher-student interaction research, as a set they were quite weak in our research, compared to the low inference data and to other high inference data. As noted above, we believe that the most fundamental reason for this is that most of these variables have come from studies which have concentrated on teacher-student interaction at higher grade levels, where verbal interchanges between the teacher and the class are a much more frequent and important aspect of schooling than they are in the early elementary grades.

Checklist Variables

At the end of the school year, each of two coders who had observed each teacher filled out a series of checklists. The checklists concerned alternative methods of behaviors that a teacher might use in a given situation. If the teacher had been observed using any one of the possible methods, the coder indicated this by checking it. If more than one of the alternative methods or behaviors was observed, more than one check was entered in the section. To get final scores, the data from the two coders were added together. This section contains many variables which do not have enough variance to allow usable data (indicated by "ND" on Table 2). This indicates that the variable was not observed or was observed so rarely that meaningful statistical analyses could not be completed.

The first checklist variable concerns teacher methods of handling catchup work when a student missed some time due to illness or some other reason for missing school. Data from the first year did not allow any analyses to be done on this variable, because the teachers were not observed often enough to permit observers to rate it reliably. Data for the second year were sparse. One curvilinear analysis reached significance for the variable of no remediation at all; that is, having the child simply skip missed work. This did not show a meaningful relationship in either group, although the curve for the high SES group suggested that teachers who consistently used this method were relatively more successful than other teachers. More meaningful data appeared for the variable "teacher explains work and has child do part of it." This variable was mixed in direction in low SES schools (although one negative correlation was significant), but was positive in direction in high SES schools. Thus, for high SES schools, this method of dealing with missed work appeared to be optimal. Nothing can be said from these data concerning methods of handling catchup work in low SES schools, since there were no positive correlations or curves for any of the variables listed.

The next section concerns rules regarding physical movement by the children in the classroom (without permission). In year 1, mixed and confusing data appeared for the variable "must always get permission to leave seat."

Both low and high SES groups showed different and contrasting curves for reading and arithmetic computation, suggesting that the curves be left uninterpreted. In contrast, the variable "can go quietly to specified places without permission at any time" yielded significant and interpretable data both years. The first year, this showed a significant negative correlation in low SES and a non-significant positive one in high SES. In year 2, this variable appeared mixed and slightly negative in low SES and generally positive in high SES. In combination, the above data suggest that more rules are required in low SES classrooms, but that in high SES classrooms children are better able to handle responsibilities and freedom on their own.

Finally, the variable "no restrictions" showed an inverted-U curve in low SES and a dropping curve in high SES, indicating that some restrictions are appropriate and necessary for children of this age. The remaining variables of this set did not have enough data to allow meaningful analyses.

The next section deals with punishment methods used by teachers when they felt it necessary to punish children. In year 1, the method of keeping children after school correlated positively for low SES and positively but not significantly for high SES. The data for year 2 show mixed reuslts, with mostly negative curves for low SES but positive relationships for high SES. Thus, the data for low SES do not replicate or hang together, but the data for high SES suggest that keeping students after school was an effective punishment method among the methods surveyed. Spanking did not occur frequently enough to analyze in the first year, and in the second year it could be analyzed only for low SES and only in certain cases. These analyses were relatively unrevealing, because they were mixed in direction and low in magnitude. They did not, however, clearly indicate that spanking was inappropriate or ineffective, as might have been predicted. At the same time, though, they did not provide any support for the effectiveness of spanking.

Isolation within the classroom could not be analyzed for low SES in the first year, but it showed negative relationships for high SES, indicating that this method was not effective. In the second year, however, there were no significant relationships of any kind for either SES group. Thus, this variable did not receive support in our data, despite the emphasis placed on it as a deisrable technique by behavior modifiers. However, the data concern attempts to use the technique and not measurement of whether or not it was used appropriately, so it is conceivable that the negative correlations resulted from inappropriate use of the technique rather than from the technique itself.

The more complete method of isolation involving removal from the classroom showed no significant correlations of any kind in the first year, but several curvilinear relationships appeared in the second year. These curves generally were negative in slope, indicating again that removal from the classroom was not a very effective technique. However, the curves were quite shallow and the relationships were not very strong. In any case, neither measure of student isolation, a commonly suggested behavior modification punishment technique, received support in the data.

Data on attempts to use peer pressure to get students to conform showed low frequencies for low SES in the first year and negative relationships for high SES, indicating that this method was ineffective. However, the data for the second year showed a significant positive correlation for high SES, contrasting with the findings for the first year. Thus the data concerning this variable are sparse and did not replicate across years.

The data on scolding showed no significant relationships the first year and only one significant set of relationships the second year, although this set involved quite high correlations. Scolding was strongly negatively correlated with success in producing student learning gains in low SES schools, but almost as strongly correlated positively in high SES schools. This fits in with the general pattern that low SES effective teachers were warm and encouraging while high SES effective teachers tended to be more critical. Scolding was relatively infrequent, however, so that the present findings should not be taken to indicate that high absolute amounts of scolding were optimal or that scolding was frequent in these classrooms. This is shown in the data for the next variable.

The data for discussion of the incident with the student, which did not involve any scolding but instead involved an attempt to make the student understand why what he was doing was wrong, showed clearcut relationships the first year. This variable was negatively correlated with success in low SES schools but positively in high SES schools. This same basic finding appeared in the data for the second year, although there were slight curves rather than straight lines. In any case, discussing the incident with the student was ineffective for low SES students but was effective for high SES students.

Taken together, the data on punishment methods do not make any sense at all for the low SES schools, since few correlations or relationships were significant and the ones which were significant were negative. None of the methods listed appeared to be regularly successful with low SES students. In contrast, with the single exception of a significant correlation for scolding, the data for high SES schools suggest that the less punitive and more informative methods were the most effective (keeping children after school and discussing the incident with them but without scolding them).

The next section deals with rewards used by the teacher. The first method concerns having classmates clap or cheer for a student. This method produced several significant relationships, mostly curvilinear, in each year. The first year's curves showed negative, dropping curves for low SES, and positive, rising curves for high SES. Thus, this method was inappropriate in low SES schools but effective in high SES schools. However, these first year findings did not replicate the second year. The data for low SES in the second year showed generally negative relationships but not as strongly or clearly as those shown in the first year data, and the second year data for high SES schools showed clearly negative relationships in place of the positive ones that had appeared in year 1. Thus, the data across years in this particular variable are flatly contradictory.

Data on the giving of special privileges as rewards were not sufficient to analyze in year 1. In year 2, a significant positive correlation appeared for high SES. The relationship in low SES was also positive, but not significant. Waiver and reduction of assignments did not appear frequently enough to allow analysis in either year.

The use of symbols such as stars or smiling faces was insignificant in year 1, but it showed positive correlations in year 2. Thus, in this case some support for bheavior modification ideas, at least as they concern rewards rather than punishments, was seen in the data. The variable concerning tokens or other methods of rewarding children with material rewards did not appear frequently enough to analyze. The same was true for the use of concrete rewards. Thus, the few data that exist for the behavior modification methods of providing rewards to children at least supported the idea of providing symbolic rewards, although in a more general sense the data also revealed that behavior modification reward methods were not being used very frequently by the teachers.

The attempt to reward children by giving them monitor jobs or other responsibilities showed no data for low SES and primarily rising curves for high SES the first year. However, the second year data produced significant negative correlations for low SES and steeply dropping curves for high SES. Thus, the data suggest that these attempts to reward students were ineffective in low SES schools. The data for high SES schools were mixed and generally curvilinear, indicating that these methods can be effective up to a point, but that attempts to use them too often will ruin their usefulness as motivating or rewarding techniques.

The method of providing public recognition to the student did not show any significant relationships either year.

As a set, the data on rewards mostly failed to replicate across years. The most clearcut findings concerned the use of symbolic rewards such as stars and smiling faces, which appeared to be effective for both low and high SES students. The data on giving jobs as rewards indicated that this method was ineffective for low SES students and curvilinearly related to effectiveness in high SES schools. The other reward methods checked either did not occur often enough to allow meaningful analyses or failed to produce significant relationships.

The following section concerns the rated appropriateness of assignments. Assignments rated as too short or too easy showed the same relationships both years: they were mildly but generally positively associated with learning gains in low SES schools but more strongly and clearly negatively associated in high SES schools. This fits with data from several other aspects of the study indicating that the low SES students benefitted most from teaching which involved briefer and more redundant chunks, while the high SES students benefitted more from difficult and more challenging questions and exercises. This same general relationship can be seen in the data on the following variables concerning boring, repetitive and monotonous assignments. Here again, although the data were somewhat mixed, they were generally positive for high SES and negative for low SES in year 1, though this did not replicate in year 2. The pattern continued in the following variable concerning assignments which were rated as too hard. No singificant relationships appeared in the first year data, but the second year data revealed some significant negative correlations for low SES schools and no data for high SES schools (indicating that overly difficult assignments were not a problem in these schools). Taken together, these data lent some support to the idea that the more successful teachers in low SES schools tended to give relatively easy assignments, while the more successful teachers in high SES schools tended to give relatively harder assignments.

The data concerning continuing activities for too long until they get boring showed no significant relationships the first year. In the second year the data were mixed, although again, the general tenor of the findings was for positive relationships in low SES schools and negative relationships in high SES schools, fitting with the pattern described above. Finally, the rating "no inappropriate assignments" correlated positively for both groups for both years, as expected.

As a set, these data concerning appropriateness of assignments hung together quite well and replicated across years. They indicated that teachers who had an optimal level of appropriateness which was matched to student ability were most successful, and that in low SES schools the danger was erring in the direction of overly difficult assignments, while in high SES schools the danger was erring in the direction of overly simple or redundant assignments. Low SES students needed to get material in shorter chunks and with more opportunity for overlearning; high SES students required challenge and faster pacing.

The following sections concern what the students do when they are distracted from their work when they are supposed to be doing seatwork. Use of the washroom revealed no significant relationships the first year. In the second year, this behavior related mostly negatively to learning in low SES schools and positively in high SES schools. There is no obvious explanation for this; it may mean that the high SES students were using the washroom only when necessary and were using it appropriately, whereas low SES students may have been abusing their privileges by using the washroom as a place to play or as a ploy to escape work.

The variable concerning repeatedly leaving the seat to get supplies for free time activities showed a single negative correlation for low SES in the first year data. However, in the second year, the data for low SES were essentially uninterpretable and suggested that this variable was not very important. The data for high SES showed a variety of inverted-U type curves, indicating that a certain optimal amount of this behavior was good. In general, the teachers who were at the optimal level probably were those who had a good variety and quantity of supplies available for free time activities and who had trained their students to responsibly and independently get these supplies as needed. The downward slope of the curves could have occurred because of cases where these supplies were available but where the teachers were too loose or inattentive about how students were using them and/or where students were using them inappropriately.

The data for watching the reading group or other activities showed mixed and confusing findings acorss years. The first year showed mixed relationships in low SES and negative relationships in high SES; the second year showed mixed and very weak relationships in low SES and generally positive relationships in high SES. The data for year 2 make more intuitive sense (given that the student is distracted, it seems that he would benefit more from watching an instructional activity than from the other kinds of distractive behavior included within this section), but the data from the first year do not. Given the obvious contradictions across years, these data are probably best left uninterpreted. The data for students talking to one another produced no significant relationships the first year and not enough data to analyze sufficiently the second year. Thus, students talking to one another was not a very important source of distraction and did not relate to student learning gains.

The data for students playing with one another when distracted also showed mixed findings which failed to replicate across years. The first year showed one significantly positive relationship for low SES schools, but also a U-shaped curve. The data for high SES schools had no significant relationships, and the relationships which did appear were opposite in direction. In the second year, this variable correlated negatively in low SES schools and positively in high SES schools. Again, this makes more sense than the first year data, but again it is contradictory to the first year data and thus best left uninterpreted.

The data for daydreaming showed negative correlations in low SES for the first year and one generally negative curvilinear relationship for low SES in the second year, indicating that daydreaming (which probably is an indicator of overly difficult assignments) was negatively associated with student learning gains in low SES schools. The data for high SES schools were weak, indicating that daydreaming either was not much of a problem or was not strongly associated in any clearcut way with learning gains.

Students asking for help or looking more closely at work on the board showed inverted-U shaped relationships to learning in year 1 and negative correlations in year 2. The much stronger correlations in low SES again underscored the point that overly difficult or confusing assignments are contraindicated for low SES schools.

The data for disrupting other students showed no significant relationships the first year, but some significant correlations and relationships the second year (generally negative). Negative relationships were expected here, although the frequency and size of the relationships obtained were below the levels expected for this variable. Disrupting other students was not much of an impediment to learning, mostly because it did not happen with any great frequency in most classrooms.

The next section concerns student attitudes toward the teacher. The first variable concerns student tendencies to seek help or concentrate harder when they were having trouble with their work. This was considered to be an indicator of good motivation and was expected to show positive relationships with learning gains. However, these appeared only in year 2. No significant relationships appeared in year 1. In year 2, there were two positive relationships and three ambiguous curves in low SES, as well as four rising curves indicating positive relationships in high SES. Thus, the second year data bore out the expectation that this variable would be positively associated with learning gains.

The next variable, indicating that students merely copied from their neighbors when having trouble, showed the expected negative correlations with learning gains in low SES, but weak and mixed correlations in high SES. The latter finding may be due to a relative absence of this problem in high SES classrooms.

The next variable concerns students working as well when they were not watched as when they were watched. This was expected to correlate strongly with learning gains, but only one set of analyses produced significant findings in each of the two years, and these were rather weak and minimally interpretable curves. Thus, this variable proved not to be very useful as a correlate of learning gains.

The same was true for the following variable concerning student tendencies to "act up" when not watched by the teacher. Strong negative associations with learning gains were expected here, but the first year data produced no significant findings and the second year data produced shallow and minimally interpretable curves. Thus, student behavior when the teacher was not watching was not a very useful correlate of student learning gains. The same was true for the variable "students seem to respect teacher." Here again, positive correlations with learning gains were expected, but no significant relationships appeared for either year.

The next section concerns free time materials available in the classroom. Unexpectedly, books correlated negatively in both SES groups the first year, while in the second year there was not enough variance to allow meaningful analyses. In this case the lack of analyses was not for lack of data, but for lack of variance; virtually every classroom had books available for use in free time. The data for the first year are believed to reflect the availability of materials other than books. That is, coder comments suggest that classrooms which had greater amounts of books available as free time materials also tended to be classrooms that were relatively lacking in other kinds of free time materials. Thus, the negative relationships do not so much mean that the availability of books was bad; they mean that other free time materials in addition to books were unavailable.

Similar unusual findings occurred for the presence of learning centers. In the first year there were not enough data in the low SES classrooms to allow meaningful analyses and there were no significant analyses in the high SES schools. In contrast, the second year data showed generally positive relationships in low SES schools and negative relationships in high SES schools. Coder comments here suggested that the positive relationships in low SES schools reflected the usefulness of such centers in a general context of relative absence of them, while the negative relationships in the high SES schools suggested that there were too many learning centers being introduced at one time and many of them were being used inappropriately during the second year of the study (at this time, the school district was moving forcefully in the direction of introducing learning centers to the classroom).

The data for listening centers in particular parallel those for learning centers in general, indicating positive relationships in low SES schools and negative relationships in high SES schools. This general pattern appears also, but more weakly, for picture files and filmstrips, science demonstrations and experiments, painting and art activity, and games. Interpretation is difficult because meaning of the correlations interacts with the general degree of availability and degree of appropriate use of these resources in the classrooms. Coders felt that these resources were less available in low SES classrooms and that this was a primary reason for the positive relationships noted in these classrooms. In contrast, such resources were plentiful in most high SES classrooms, and the negative relationships appear to reflect inappropriate use (primarily the attempt to introduce too many learning centers and other special activities at once rather than phasing them in gradually and instructing the children in the proper use of them).

Instructional games surprisingly showed a negative correlation in low SES, and non-instructional games showed negative relationships in both SES groups. Aquariums and looking exhibits also showed negative relationships in both groups. There is no obvious reason why the presence of these activities should detract from learning; in any case, the negative relationships provide no support for their usefulness or importance.

The following section deals with the same materials from the perspective of the degree to which they were used as opposed to whether or not they were merely available. A somewhat different pattern of findings emerges which helps clarify some of the data from the previous set. For example, the negative relationships involving the use of books disappear in this set of data; the frequency of books actually used showed no significant relationships in either year. However, the data for learning centers in general and for some of the more specific kinds of activities showed again the general pattern of positive correlations in low SES and negative correlations in high SES. Again, the explanation for these different findings probably resides in their availability and proper use, and not in differences in the children or the teachers.

Most of the puzzling negative relationships regarding instructional games, non-instructional games, and aquariums and other looking exhibits that appeared for simple availability of these items disappeared when the ratings of actual use of the items were taken into account. Thus, the puzzling and inexplicable relationships mentioned above have disappeared, although the data still provide no positive support for the usefulness or importance of these activities and resources.

The next variable concerns the use of peer tutoring. No significant relationships were produced in the first year; in the second year there were significant negative relationships in math for low SES and non-significant positive ones in high SES. This is yet another example of the general finding that indirect teaching and other learning methods that require students to learn on their own, rather than from the teacher, tend to be inappropriate at this grade level, particularly in low SES schools.

The next variable concerns assignments of homework in addition to seatwork. In the first year this variable was negatively related to learning gains in low SES and positively in high SES. The second year data revealed several weak and mostly uninterpretable curves. However, the general nature of the data suggests that homework is undesirable at these grade levels in low SES schools possibly because the student will have difficulty with it and may end up practicing errors in the absence of a teacher to check his work and give feedback), although it may be useful to some degree in high SES schools.

The final variable concerns teacher underreaction to control problems so that they sometimes go unresolved. This did not happen often enough in the second year to allow menaingful analyses, but in the first year a significant negative correlation appeared for low SES and a non-significant positive one in high SES. This is part of a general pattern suggesting the importance of maintaining tight control over the classroom in low SES schools, even to the extent that it might be better for the teacher to err on the side of over-reaction rather than delay or underreact when some kind of discipline problem breaks out. However, this finding should be taken in the more general context of findings supporting Kounin's contentions that the most effective classroom managers are those who keep the students actively engaged in productive activities so that the disruption does not break out in the first place.

Observer Ratings

Table 3 contains data from 41 high inference coder ratings. These ratings were made on 5-point scales (13-point scales for the first three variables), and dealt with general teacher personality traits or characteristics which are more reliably and validly measured through high inference ratings than through low inference coding of discrete units of interaction. Again, each of two raters, who had periodically observed the teacher each year, made independent ratings, and the ratings were then added to obtain a final score.

The first three ratings deal with teacher affectionateness towards the children. These ratings indicate the point made above that the demandingness and criticism seen in high SES teachers was largely restricted to their responses to student work and answers to questions, and was not part of a more general pattern of negativism. Note that although not many relationships for the three measures of teacher affectionateness reached significance, those that did for the high SES teachers indicated positive, or at least positively rising curve relationships between affectionateness level and student learning gains. Thus, in high SES, teachers' general affectionateness toward the children was positively associated with student learning gains, at least up to a point. In contrast, the relationship of affectionateness to student learning gains in low SES classrooms was more ambiguous, showing a variety of curves and a few negative correlations or linear relationships. The negative linear relationships occurred for the ratings of extreme affectionateness, indicating that teachers who were either gushy and melodramatically affectionate on the one hand, or cold, hostile, and rejecting on the other hand, were less successful than teachers with a more moderate level of overt affectionate behavior toward the children in low SES schools.

Given the more general context of findings in low SES vs. high SES schools, it might be argued that the relationships between teacher affectionateness and student learning are curvilinear (in inverted-U shaped fashion) for both groups, if we proceed from the assumption that the low SES teachers were generally somewhat more affectionate toward the students than the high SES teachers. This assumption would explain the various findings that exist for different measures of teacher affect, including the general nature of findings that the low SES effective teachers worked through patience and encouragement while the high SES effective teachers worked through demandingness and criticism, even though the present affectionateness data suggests that affectionateness correlates negatively with learning gains in low SES schools but positively in high SES schools.

The next variable deals with solidarity with the class and promotion of a "we" feeling. Unexpectedly, this variable correlated negatively in low SES the first year. The high SES data revealed inverted-U curves, as expected. The data from the second year failed to produce interpretable results, indicating that this variable was not very useful as a correlate of student learning gains.

The variable "patient and supportive when correcting" produced no significant relationships the first year and mixed findings the second year. This variable was correlated negatively with student learning gains for high SES (paralleling several other findings), but showed weak and mixed relationships in low SES. This again reveals the role of demandingness in the behavior of the more successful high SES teachers.

The variable "students allowed choice in assignments" showed no significant relationships in the first year. In the second year, some positive relationships appeared for high SES classes only. This fits in with the more general finding that high SES students appear to benefit from opportunities to work independently.

The next variable deals with accepting student ideas and/or integrating them into the discussion. In the first year, this variable was consistently negatively correlated with student learning gains in the low SES classrooms, and mostly curvilinearly related (in inverted-U fashion) to learning gains in high SES classrooms. In the second year the data were weak and near-zero for low SES classrooms but negative for high SES classrooms. This again is part of the general pattern of non-support for the ideas concerning indirect teaching as relevant or advisable in teaching students at the early elementary grades. They well may be appropriate and perhaps optimal at the higher grades, but they apparently are not at these early grades.

The next variable deals with the teacher's ability to admit her own mistakes and laugh at herself in appropriate situations. As expected, the only significant correlation here was a positive one, occurring in low SES classrooms during the first year. However, the variable did not appear to be very important, paralleling the data for similar variables such as teacher credibility, promotion of a "we" feeling, and other measures of the teacher's student orientation. As with indirect teaching, a student oriented attitude appears to be relatively unimportant in the early grades, at least in its relationship to student learning.

The next variable, "usually bends, gets down to child's level," showed the expected positive relationship to learning, but here again only one of a possible ten relationships reached statistical significance.

The next variable deals with the teacher's method of going to students' seats to check work rather than having them come to her desk. This variable yielded no significant relationships in the first year. In the second year the relationships were uninterpretable for low SES, but the variable showed strong negative relationships for high SES. This is part of the broad pattern in high SES schools suggesting that the more effective teachers expected and allowed students to take personal responsbility for much of their activity during seatwork and free times, as opposed to supervising them overly closely and unnecessarily.

The variable "usually speaks to individuals rather than to the whole class" showed only one rather uninterpretable relationship across the two years, and thus appeared to be relatively unimportant. The same was true for the variable "uses advance organizers in introducing activities." Thus, little support for the importance of this variable is evident in the data, despite the stress upon it by Ausubel and others. Again, the reason probably lies in the age level of the students and the kinds of activities going on at the time, rather than in an absence of importance of the variable itself. It probably is much more important at higher levels, particularly when teachers are lecturing on new and difficult material.

Similar findings appeared for the next variable "gives complete, detailed instruction; prevents errors before they happen." Although there was some weak evidence of a positive relationship in high SES schools, the more general nature of the data suggests that this variable is not very important to student learning at this grade level.

The variable "students eager to respond; no fear" showed no significant relationships in the first year, but some significant negative relationships in high SES schools in the second year. This finding was of course unexpected, although given the data for high SES schools it is easily seen as part of the general pattern of demandingness and criticism that characterize the high SES teachers who were most successful in producing student learning gains. This is one suggestion that the methods used by the high SES teachers who were most successful in producing learning gains may have and probably did involve a trade-off between success in producing learning gains vs. success in producing optimal student attitudes. The high level of demandingness could have reduced student eagerness to respond to teacher questions.

The variable "teacher waits patiently if student doesn't respond" showed generally negative but weak relationships with learning gains, although there was one positive relationship in year 1 for low SES. This is another indication of the relationship between demandingness and student learning, although the relatively weak data for this variable, in combination with the data for general affect and for criticism of specific student failures again indicates that the demandingness associated with learning gains was primarily restricted to student failure to perform successfully, and was not part of a general pattern of negativistic and hostile behavior.

The variable "non-competitive atmosphere; no signs of eagerness to see others fail" showed contrasting curves for the two SES groups. Relationships were generally weaker and less interpretable for low SES, although the data in general suggest that the teachers who had notably non-competitive atmospheres were less successful than other teachers. This held only for teachers at the extremes of non-competitiveness, however, and may have reflected a relative unconcern about student learning among these teachers.

The data for high SES classrooms, in contrast, generally show inverted-U curves indicating an optimal relationship on this variable. That is, a certain degree of competitiveness appeared to be associated with maximal learning gains, with lower gains being achieved in classrooms that had either less or more of this competitiveness.

The variable "students allowed to work in cooperative groups" produced significant relationships for each analysis in each year. However, the data are much more interpretable for high than for low SES. In high SES this method was generally positive although ultimately curvilinear, indicating that cooperative group assignments were a good idea in high SES schools if not carried too far. The curves and lines for low SES are much less consistent, although those which are interpretable suggest a generally negative relationship between this type of teaching method and student learning gains. Thus, the data fit the more general pattern suggesting that methods based upon allowing and expecting students to assume independent responsibility for managing their own learning are more likely to succeed in high than in low SES at these grade levels. Had the study been conducted at higher grade levels, the data might have been more positive in both SES groups.

The teacher behavior of recognizing good thinking even when it doesn't lead to correct answers produced conflicting but primarily positive curves in the low SES schools and inverted-U shaped curves in the high SES schools in the first year, and a single positive correlation in the low SES schools in the second year. Thus, this teacher behavior appeared to be positively associated with learning, although only up to some optimal point. Perhaps too much of this kind of behavior ruins the pacing and flow of a lesson and becomes more distracting than helpful. In any case, although the general relationship with learning was positive, it was curvilinear and not linear.

A democratic leadership style produced only two inverted-U relationships in the first year and no significant relationships at all in the second year. Here again, there is only weak and somewhat mixed support for some of the ideas traditionally stressed in textbooks. Again, we believe that the reason for this lies in the grades being studied. Democratic leadership styles could be expected to be more important and more effective with older students.

The variable "few restrictions on students during seatwork periods" produced no significant relationships the first year and mixed findings the second year,indicating negative relationships in low SES and weak positive ones in high SES. This again fits with the general pattern that teachers in low SES classrooms imposed more restrictions and generally tighter controls on student behavior than did teachers in high SES classrooms.

Expecting students to care for their own needs without getting permission was consistently correlated positively with learning gains in high SES schools but was essentially unimportant in low SES schools. This again fits with the pattern of findings on a number of variables to the effect that high SES students appeared to benefit from being allowed and expected to assume independent responsibility for meeting many of their needs.

Teacher concern with substantive content rather than form of student responses produced generally positive but curvilinear relationships with learning, indicating that this was in general a good thing if not carried too far. The same was true of teacher stress on factual realism vs. rejection or correction of childish idealism. It was also true, although there were fewer and less interpretable relationships, for teacher credibility. Thus, several variables dealing with the credibility, realism, and student orientation of teachers showed expected positive correlations with learning, but most relationships were curvilinear and were generally weak.

Teacher showmanship proved to be important as a correlate of learning gains in low SES schools, but it had non-significant negative relationships with high SES schools. These data are similar for the related variable of teacher enthusiasm.

Teacher getting attention before starting a lesson correlated positively with learning gains in high SES schools the first year. The second year produced some uninterpretable and weak curves and lines for low SES schools, and some mild inverted-U curves for high SES schools. Thus, this variable appeared to be somewhat important in high SES schools, but its relationship with learning was curvilinear rather than clearly linearly positive.

Teachers rated as having chaotic and poorly planned schedules showed the expected negative correlations with learning in high SES schools the first year, but relationships in low SES schools were mixed. The data were also mixed in the second year, and there was even a positive correlation for high SES schools, reversing the negative relationships seen the year before. Thus, the data on this variable did not replicate across years and are internally inconsistent.

Teachers rated as self-confident and self-assured did not do systematically better than other teachers; only one analysis for this variable revealed significant relationships, and these are only minimally interpretable. Thus, like other variables that apparently are important with older students, this variable is relatively unimportant with younger students in the early elementary grades.

Teacher politeness in dealing with the children showed curvilinear relationships in both SES groups, indicating that a certain amount of this was good but that teachers very high on the variable were less successful in producing learning gains than teachers with medium scores. These findings differ somewhat from the expected linear positive relationships. Perhaps the teachers who were extremely high on this measure were the same ones who were rated as ineffectively over-emotional (gushy).

The variable high concern about achievement showed no significant correlations the first year and a single significant positive correlation for low SES schools only in the second year. The positive correlation was expected, but the lack of other significant relationships is surprising. This is not only because high teacher concern about and expectations in the areas of achievement were expected to be highly correlated with gains in achievement, but also because data from other aspects of the study suggest that high teacher expectations and demandingness are associated with student learning gains. These considerations suggest that what the coders were rating on this variable was not quite the same thing as the evidence of high teacher expectations and concern about achievement that is revealed in some of the low inference data.

Ratings of the room as physically attractive showed mixed correlations with learning gains. The data were generally inconsistent and contradictory both within and across years and for both social class groups. There is some tendency for the positive correlations to be associated with gains in language arts and the negative ones to be associated with gains in math. This is one of the very few places where the pattern of data significantly differs between these two major curriculum areas. However, the reasons for this differential relationship to language arts vs. math are unknown.

The variable "teacher gives much encouragement to students" failed to show significant relationships in either year. This is something of a surprise given the data for low SES suggesting that the more encouraging teachers were more successful,and it again calls into question what the raters may have been rating on this variable.

The rating "room is uncrowded" showed clearcut and consistently strong positive correlations with learning gains in the first year, but these relationships were not well replicated in the second year. The second year data show weak and mixed findings in low SES, and inverted-U curves for high SES. Again, the data are too inconsistent and conflicting to allow clear interpretation.

The variable "teacher explains rules or decisions when reasons aren't obvious" showed positive but occasionally curvilinear relationships to student learning. In general this appears to be important, but especially so for low SES classrooms. This fits in with other data suggesting that these children are especially in need of teacher structure and explanation.

The rating of the teacher as well organized and well prepared showed mostly positive but nevertheless mixed findings the first year and no significant correlations the second year. Positive correlations were expected on the basis of existing literature, but these did not appear.

The rating of the teacher as regularly monitoring the class and keeping up with what is going on showed positive relationships in the first year (essentially for low SES only), and generally weak findings the second year except for a single significant correlation (again in low SES). Thus, insofar as they go, these positive findings support the ideas of Kounin concerning "withitness" in monitoring the classroom for better classroom management, but the findings are not very strong or consistent. They also show that this variable is more important for low than for high SES.

Teachers rated as having smooth and efficient transitions which involve little wasted time showed positive correlations in low SES but no notable relationships at all in high SES. Taken together with the previous variable, the data suggest that the ideas of Kounin concerning keeping students continually engaged, monitoring them to prevent outbreaks from happening, or preventing them from getting worse once they are begun are important in low SES schools, but not so much in high SES schools.

Teachers who have an automatic system to determine monitors tended to be more successful than other teachers who picked monitors randomly or used monitor appointments as rewards, although this variable was sometimes curvilinearly rather than linearly related to achievement.

Teachers who were rated as having a "busy" or "quiet" classroom tended to be less successful in producing learning gains than other teachers, although the findings are mixed. Also, the variable did not appear to be of any great importance given the lack of consistent relationships and the lack of strong relationships even when statistically significant ones were observed.

Ratings of students as compliant and obedient showed differential findings by social class. In low SES classrooms there was a significant negative correlation the first year and mixed and weak curves the second year. In high SES there were no significant relationships the first year but in the second year there were several rising curves. Thus, up to a point at least, student compliance and obedience was positively associated with learning, but only in high SES classrooms.

Teachers who gave overly explicit and repetitive directions showed mostly curvilinear relationships with learning, although there were some significant negative relationships also. In general it was not a good idea for teachers to be overly repetitive to the point of boring the students, although a certain amount of redundancy and repetition appears to be useful.

Finally, teachers who had well established routines for taking care of daily housekeeping needs and minimized interruptions for this purpose did not differ systematically in their success in producing learning gains from other teachers. The first year this variable showed a single negative correlation in low SES, but this was contradicted by a single significant positive correlation, also in low SES, the second year. The curves produced in the second year data were mostly weak and uninterpretable, suggesting that this variable is relatively unimportant as a correlate of student learning gains.

Time Utilization Measures

Several variables concerned with utilization of classroom time were measured through high inference estimations of the time spent in various activities. These data are presented in Table 4.

The percentage of total available time which was actually structured by the teacher showed no relationships for low SES. For high SES, there was a significant negative correlation in year 1 but a significant rising curve in year 2. Thus, this variable did not have consistent and important relationships to student learning.

The percentage of teacher structured time which was related to language arts showed some puzzling correlations. In the first year it had a significant negative correlation with learning gains in word knowledge (a language arts subtest) in low SES schools. In the second year it had inverted-U curvilinear relationships to word knowledge gains and negative relationships to reading gains. It also had negative relationships to gains in arithmetic. The negative gains with arithmetic were expected, but the negative relationships to learning gains in the two language arts subtests, and more generally the lack of positive correlations between this variable and gains in language arts, is confusing. Observer reports suggest that the reason may have been the variability of the teachers; the majority of the teachers spent much time each day on language arts, while the time spent on math was more variable.

The next variable, percentage of structured time spent in math, showed slight positive correlations with reading gains the first year and slight negative correlations with word discrimination gains the second year. For the math criterion tests, significant data were obtained only for arithmetic computation in the first year, and even here the data were contradictory: the curve is mostly negative in low SES but positive in high SES. Again, it was expected that this variable would correlate positively with math gains and perhaps negatively with language arts gains, but this was not the case.

Thus, in general, the percentage of classroom time devoted to the two major subject matter areas tapped by the criterion tests did not in itself relate consistently to learning gains. In fact, most relationships between time spent in a subject area and student scores in that area were negative. However, it should be noted that teachers spend considerable portions of their time in both of these areas; the data would have been considerably different if certain teachers spent little or no time in an area.

Percentage of structured time spent in art activities showed positive correlations, particularly in the first year, with student learning gains in high SES schools. It was expected that this variable would be more positively associated with learning gains in high SES schools than in low SES schools, but the general pattern of findings, particularly with the previous two variables taken into account, was surprising. It is unclear as to why time spent in art should correlate positively with learning gains in language arts and mathematics, when time spent in these two subject matters does not. It cannot be determined from the data whether the art activities themselves contributed to the learning gains or whether time spent in art activities is a "proxy" variable which is associated with general teacher competence and more specifically with planning and implementing a variety of activities in the classroom.

The percentage of time spent in spelling showed a number of significant curves which are largely uninterpretable, along with some negative correlations the second year for gains in arithmetic. The last finding was expected, in that it shows that the more time spent in spelling the less the students learned in arithmetic, but the rest of the data do not hang together to support this as a general statement across all ten sets of data.

The percentage of time spent in reading groups correlated positively with learning gains in both reading and mathematics in low SES but negatively in high SES in the first year, and there was a tendency for this same kind of relationship in the curves seen for word knowledge in the second year. Thus, time spent in reading groups was generally associated positively with learning gains in low SES schools but negatively in high SES schools. The reasons for this appeared to lie in the grade levels studied and the relative abilities of children. The low SES children in these grades were still learning the fundamentals of reading which appear to be taught best (or at least well) in small reading groups. In contrast, the high SES students were often to the point where they no longer needed heavy dosages of time spent in reading groups practicing the fundamentals and were moving toward the point that they could read on their own and move into more independent activities.

The percentage of structured time spent in social studies showed no significant relationships the first year. The second year data revealed mixed lines and curves in low SES but generally negative ones in high SES, indicating that much time spent in social studies was negatively associated with learning gains in language arts and mathematics. This is the sort of relationship that was expected, but it is difficult to evaluate because the more direct relationships between time spent in the two curriculum areas of language arts and math did not show such clean relationships with learning gains.

The proportion of time spent in transitions between activities showed mixed and uninterpretable relationships in low SES but generally downward sloping curves in high SES. The high SES data provide more support for the suggestions of Kounin to the effect that successful classroom management involves, among other things, keeping things moving and avoiding time spent in getting organized or making transitions from one activity to another.

Time spent in routine activities done in the morning before school actually got under way did not show any relationships in either year. The percentage of time spent in special activities showed a negative correlation with arithmetic computation gains in low SES for the first year, and some mixed curves in the second year. These data are not very interpretable, most probably because "special activities" included a large number of diverse activities.

The percentage of time spent in structured seatwork showed no significant relationships the first year. In the second year there was a positive relationship with word knowledge gains in low SES and a negative one in high SES. This again probably represents the same kind of difference in pupil learning of basic tool skills and early curriculum goals as was mentioned above concerning structured time in reading groups. Low SES children still could benefit from heavy dosages of structured seatwork, but high SES children were moving to the point where they would benefit more from different kinds of activities and from being given more choice.

The proportion of time spent in free choice seatwork showed no significant relationships the first year. In the second year there were not enough data to analyze for high SES but the relationships were negative for low SES. These data for low SES parallel the data for the previous variable, indicating, in general, that these children benefitted from structured seatwork rather than from being allowed free choice of assignments.

The percentage of time spent with a leader other than the teacher showed no data in either subgroup for either year (because it happened so infrequently).

As a set, the time utilization variables raised more questions than they answered. The expected relationships between time spent in language arts and mathematics and learning gains in these two areas did not materialize, and the relatively few consistent relationships that did appear tended to be more confusing than enlightening.

Lesson Presentation Variables

Information about several aspects of teacher behavior during presentation of formal lessons are presented in Table 5. In the first year of the study, these were measured with a low inference coding system that was used on only ten teachers, so that there are not enough data to allow multiple regression analyses of these first year relationships. Consequently, Table 5 contains data for the second year only. These data came from rating scales completed by the observers during visits to the classroom. Coders estimated time spent by the teacher on each of the possible steps in presenting a lesson to the class. The scale ranged from 1 (no time spent) to 5 (over 10 minutes spent).

The use of advance organizers in beginning lessons showed a weak negative correlation in low SES and a weak positive one in high SES. Again, there is no clearcut support for the ideas of Ausubel concerning the importance of advance organizers. However, the SES difference does suggest that this variable will become more important as the children get older and as learning becomes more and more concentrated upon verbal presentation symbolic content as opposed to demonstration and practice of physical skills.

Review of old material showed weak and uninterpretable relationships in low SES but positive correlations in word knowledge and reading for high SES. It should be noted that this variable does nct indicate time spent reviewing old material in general, it refers to reviewing old material in the process of introducing a lesson, and thus is a form of advance organizer. Teachers who do this are linking the new lesson to what was learned yesterday or at some time in the past. Thus, the relationship for high SES parallels the one for the use of advance oragnizers. The lack of positive findings for low SES is somewhat confusing, however, since it would seem that this teacher behavior should relate positively to learning gains in low SES schools, too.

Presentation of new material showed inverted-U shaped but generally dropping curves in both groups. This is more evidence of the fact that children learn best when an optimal amount of information is presented at a given time. The nature of the curves suggested that teachers tended to err on the side of presenting too much rather than too little.

Practice of new material was unrelated to learning in low SES but positively related to learning in high SES. Again, the low SES data are puzzling, since we had expected this variable to relate positively to learning in both groups.

Summarizing reviews at the ends of lessons correlated negatively with learning in low SES and positively in high SES. Taken together with the data for advance organizers and for review of old material, a more general statement might be that the high SES children tended to benefit from teacher verbalizations which placed a lesson in context and which followed the old maxim of "tell them what you're going to tell them, then tell them, then tell them what you told them." However, the data for low SES are virtually uninterpretable because all of the relationships are negative; there is nothing in this set of five variables that correlated positively with student learning in the low SES schools.

Teacher afforded evaluation correlated negatively with student learning in low SES schools and showed a mixed but generally positive pattern in high SES schools. This is probably related to the praise and criticism data that are discussed elsewhere, which indicate that teacher evaluative reactions, particularly criticism of incorrect or inappropriate answers, was positively related to student learning gains in high SES schools but negatively in low SES schools.

Teacher elicited student self-evaluation did not happen often enough to allow analysis. Instructions concerning follow-up assignments correlated negatively in low SES and positively in high SES. This is another example of a variable that was expected to correlate generally positive with student learning, but did so only for high SES children.

Independent activities during lessons (children given a chance to work on their own with the teacher spot checking them), had generally positive relationships with learning for both groups, although the relationships were more consistent for high SES.

Finally, dead spots during a lesson showed weak and uninterpretable curves for word discrimination gains.

Taken as a whole, the lesson presentation variables are confusing and uninterpretable for low SES students because of the generally negative nature of the data. Only independent activity showed a positive relationship with learning, and even this was curvilinear and somewhat inconsistent. As far as it goes, it fits with the general pattern that low SES students learn more from actual practice than from verbal discussion or from watching and listening, but this pattern was not borne out in other variables in this set. In contrast, the data for high SES children hold together nicely, indicating that they benefit from most of these lesson presentation variables which had been stressed by various writers. The SES difference in itself fits with our general interpretation that much of the teacher behavior stressed by textbooks is relevant for teaching that is primarily verbal discussion of symbolic material but less relevant for teaching which involves demonstration and practice of physical skills.

The next set of variables deals with categories of teaching methods that teachers used to try to put across the content.

Lacturing was unrelated to student learning, contrary to the predications that might have been made by those who stress indirect teaching and would expect a negative relationship here.

Teacher demonstrations were curvilinearly related to student learning in language arts. In mathematics they were positively associated with learning gains for low SES but unrelated to learning gains in high SES. This is one of several examples showing that the low SES children were more dependent upon teacher demonstration and correction than were high SES children.

Focused discussion revealed mixed but mostly negative correlations in low SES and mixed and largely uninterpretable correlations in high SES. Unfocused discussion revealed weak and uninterpretable relationships in low SES and slight positive relationships in high SES. Taken together and in combination with the data for lecture and demonstration, these four method variables indicate that the low SES children benefit more from teacher directed instruction and do not benefit much from verbal discussions, in contrast to high SES students who may not be so dependent upon the teacher and who do appear to benefit at least some from verbal discussions.

Silent reading showed a single positive correlation with learning (in arithmetic reasoning, however), for low SES. This makes sense at one level because performance on an arithmetic reasoning test requires silent reading of the problems, although more generally we expected this variable to relate more consistently to learning gains in language arts than to learning gains in mathematics.

Oral reading showed no significant relationships in either group for any of the criteria.

Drill (mostly mathematics drill, but sometimes phonics or other language arts drill) showed weak relationships with word knowledge gains (negative for low SES and positive for high SES). Coder comments suggest that the relationship here (which was the opposite of what was expected) might be best understood by taking into account the frequencies of these activities at the two different types of schools. There was heavy use of drill (mostly appropriately) in the low SES schools, but not nearly as much in the high SES schools. Thus, the relationships might reflect a tendency of certain low SES teachers to overdo drill and certain high SES teachers to overlook it, rather than the simple linear relationships that are suggested if one takes the findings at face value.

The percentage of time in problem solving activities showed generally positive relationships for both groups, although the correlations were more consistently positive for high SES than for low SES schools, as might have been expected. In any case, this set of findings, along with those discussed earlier concerning teacher interest in the substance rather than the form of student responses, suggest that teachers who were tyring to help the children learn how to think, in addition to what to think, and who stressed such activities as reasoning, generalization, and problem solving were more effective than teachers who did not. It is worth noting that this finding came through even though the criteria used were standardized achievement tests which are often criticized for stressing only the low level curriculum objectives involving primarily factual memory and not placing enough emphasis on reasoning and problem solving abilities. It is also notable that the variable correlated with all of the learning criteria except arithmetic reasoning, which is the test that most clearly involved problem solving. These seemingly paradoxical data are not unique; Soar (1972) has also noted that concentration on lower level activities sometimes leads to better performance on tests of higher level abilities, and vice versa. In any case, teachers who went beyond drilling the children in simple facts and skills by challenging them to apply what they had learned to solving problems were more successful than teachers who did not.

The next set of variables deal with the curriculum materials and teaching vehicles used by the teachers.

The use of standardized materials provided with the curriculum showed mixed but mostly negative relationships with student learning in low SES schools but consistently positive (although sometimes curvilinear) relationships with learning in high SES schools. This parallels the results from last year, and also the teacher comments on the interview and questionnaire, which indicate that sticking with the prescribed curriculum materials was associated with success in high SES schools, but that the more successful teachers in low SES schools supplemented or substituted by using other methods and materials.

The use of teacher-created materials showed mixed findings in low SES but generally positive findings in high SES. However, the high SES data appear to result primarily from the activities of a few teachers who were at the extremes, particularly the ones who made heavy use of their own homemade materials. These teachers tended to be relatively more successful than the others. Teachers who were medium on this variable were no more successful than teachers who were low on it.

The use of audio-visual aids showed curvilinear relationships in both groups. The nature of the curve suggests that these aids were more useful in low SES schools than in high SES schools, but in general an optimal relationship appeared to produce the best gains. That is, teachers who were either very low or very high in their use of audio-visual aids generally got poorer results than teachers who were more moderate, particularly in high SES schools.

Games and activities did not appear frequently enough in low SES schools to allow anlayses. The high SES schools anlayses produced only a single uninterpretable curve. The use of learning centers did not appear frequently enough to allow analyses in either group.

Taken together, the data indicate that teachers in high SES schools did best when they stayed with the standardized materials for the most part, although teachers who made heavy use (as opposed to low or moderate use) of their own homemade materials and who used audio-visual aids judiciously were more successful than the others. In low SES schools, teachers who deviated from the standardized materials, particularly by using the audio-visual aids, were more successful than those who stuck strictly with the materials provided in the curriculum.

The next three variables deal with the degree of individualization during lesson presentation. Specifically, they account for the amount of time the teacher spent with the whole group, with pairs of individuals, or with indivi-

The next three variables deal with the degree of individualization during lesson presentation. Specifically, they account for the amount of time the teacher spent with the whole group, with pairs of individuals, or in dyadic interaction with single individuals. In general, teachers who spent much time with individuals, even within group context, were more successful than teachers who tried to work with the group as a whole or with pairs. Children at these grade levels appear to need individual monitoring and feedback, particularly when they are learning brand new material and trying to apply it for the first time.

The final variable on the table concerns the use of non-patterned turns in group lessons, particularly reading groups. Non-patterned turns refers to the practice of calling on children randomly or at least in some uninpredictable way, as opposed to calling on them in a pattern which allows the children to know when their turn will come up. Like last year, this variable unexpectedly correlated negatively with student learning gains, particularly in low SES schools. We had expected a positive relationship on the theory that non-patterned turns would keep the children continually accountable. However, whatever gains this aspect might involve appear to be overcome by the problems of anxiety that are introduced in this method. Also, our own observations in past work and the comments of certain teachers suggest that the use of patterned turns serves to insure that each child gets about the same number of opportunities to interact with the teacher and to recite in the group. When the teacher calls on students "randomly," she sometimes calls on the higher achieving or more eager students much more often than she calls on the lower achieving or less eager students. Thus, all things considered, patterned turns appear to be superior to non-patterned turns as a method of calling on students to recite or answer questions in small group settings at these grade levels.

Low Inference Process Variables

The variables presented and discussed from Tables 1 through 5 all came from high inference ratings, checklists, and other high inference measures. In contrast, the behavioral process data in Tables 6, 7, and 8 come from the low inference observations made with the modified Brophy-Good Dyadic Interaction Observation System. The data of Table 6 come from whole class interactions in the mornings; the data of Table 7 from whole class interactions in the afternoons; and the data of Table 8 from interactions occurring during reading groups. Most variables appear on all three tables; the behavior involved is the same but context differed. Consequently, the three tables will be discussed jointly, going through the variables in order and taking into account the data on the three tables simultaneously rather than discussing each table separately.

The first four variables deal with the teachers' methods of selecting respondents to their questions. Every time a teacher asked a question, the observer coded whether the teacher preselected the respondent before asking the question; asked a question but then called on a non-volunteer; asked the question and then called on a volunteer who had his hand up; or did not get a chance to identify a respondent because some student called out the answer without permission. Data on these four alternative methods by which students could get a response opportunity are shown in the first four variables of the tables.

The data on preselecting a respondent before asking the question showed confused and contradictory correlations. In the first year the data were mixed for low SES but consistently negative for high SES. However, in the second year the data were still mixed for low SES but now consistently positive for high SES. We do not know why this variable correlated so consistently positively with learning gains in the high SES schools.

Calling on non-volunteers yielded few significant relationships, and those which did appear were inverted-U shaped curves indicating that a certain optimal amount of this behavior was better than either too much or too little. This confirmed expectations, although the number of significant relationships was small.

The data for calling on volunteers indicated a fairly consistently negative relationship in low SES and positive relationship in high SES for the first year, but this was not replicated the second year when only a few analyses produced significant relationships and these were mostly uninterpretable curves.

Finally, the data for student call outs indicated positive relationships in low SES (except for reading group) in the first year and mixed relationships in high SES. The data for the second year indicate mixed, somewhat positive relationships for low SES but consistently negative relationships for high SES. Taken together, the data for year 2 suggest that it was better for teachers to preselect respondents or call on volunteers than to allow students to call out answers. This is one indication of the problem of competitiveness and over-eagerness to respond in the high SES schools. This apparently was not a problem in low SES schools. Unfortunately, however, the data do not hang together in any clear-cut fashion for low SES schools to indicate that any particular pattern of selecting respondents is preferable. They do indicate, however, that student call outs in the low SES schools were neutral to positive, whereas they tended to be negative in high SES schools. Thus, in the low SES schools call outs probably represented an index of good motivation and attention, and they apparently do not occur so often as to constitute a management problem, whereas in the high SES schools they occurred more often and presented enough of a problem to cause them to relate negatively rather than positively to learning gains.

The next two items deal with the difficulty level of teacher questions. In general, process questions were the most difficult (how and why questions) and choice questions (where the child only has to indicate one of a series of alternatives) were the easiest, with product questions (recalling a fact from memory) being in between. Process questions produced one positive relationship in each SES group the first year. In the second year process questions produced several curves in both groups for morning interactions, but the curves for both groups were rather weak. We believe that this is because process questions were very infrequent at these grade levels, and even the ones that were asked were relatively low level process questions rather than highly abstract or complex ones. Process questions should begin to become positively associated with learning gains as children get older.

Choice questions showed a mixed pattern across groups and years. In the first year, choice questions in morning interactions correlated positively with gains in low SES, but these findings were not replicated the second year. In afternoon interactions, the data show one positive and one negative relationship for each SES group in the afternoon, and no significant relationships in the second year. For reading group interactions, the data showed negative correlations for low SES the first year and positive relationships for high SES the second year. This is one of the few variables that shows sizeable and clear differences in the pattern of correlations of criteria dependent upon context (morning vs. afternoon vs. reading group). With some exceptions, the data for general class interactions supported expectations that choice questions would correlate positively with learning gains in low SES and process questions would correlate positively though weakly in high SES. However, the pattern was reversed in the reading group, for unknown reasons. We plan to investigate correlates of these variables to see if some clues can be discovered as to why these context differences in the relationship of question difficulty to student learning gains appeared.

The next five variables on each table deal with the quality of student response (correct, part correct, wrong, "don't know," and no response). Like question difficulty, to which the quality of student response is related, this variable showed context differences between reading group and general class interaction. It also showed failures to replicate (at least in terms of precise relationships) across years. In the first year, correct answers in morning interactions were correlated negatively with learning gains in both groups for the most part, but in the second year the correlations were more positive for low SES but still mostly negative for high SES. Afternoon interactions in the first year indicated positive relationships for low SES and uninterpretable U-shaped curves for high SES. The second year data yielded a slightly positive relationship for low SES and a significant negative relationship for high SES. Reading group data indicated positive relationships for low SES and negative ones for high SES the first year, but in the second year there were only two uninterpretable curves. Thus, the majority of the data suggests that the percentage of correct answers was positively related to student learning gains for low SES schools and negatively for high SES schools, but the data on morning interactions from the first year also show some negative relations for the low SES schools.

The percentage of part correct answers yielded only curvilinear relationships. These were mixed for low SES and mostly positive for high SES. The data on wrong answers in the morning revealed mixed findings for low SES and inverted-U relationships for high SES in the first year, but negative relationships for low SES and positive ones for high SES the second year. The data for the afternoon yielded no significant relationships the first year, and weak and mixed data for low SES but positive relationships for high SES the second year. Finally, the data for reading groups indicated negative relationships the first year for low SES and positive or inverted-U relationships for high SES, while the second year data indicated uninterpretable flat curves for low SES and mixed but mostly positively rising curves for high SES. In sum, the data on wrong answers suggest that they are mostly negatively related to learning in low SES schools and positively but somewhat curvilinearly related to learning in high SES schools.

The next set of data deals with situations where the teacher asks a question and the child says (aloud) that he doesn't know the answer. The relationships involving this variable are mostly curvilinear, the majority suggesting positive but mildly inverted-U shaped relationships. Thus, student tendencies to say "I don't know" when they cannot respond are generally positively related to learning gains, although learning gains are lower in classrooms where this particular behavior is extremely frequent.

The final category of student responses is "no response," indicating that the student not only didn't answer the question, but said nothing. No significant relationships were found for the reading group, and only some negative correlations with arithmetic reasoning gains were found for afternoon reactions. However, morning interaction data revealed mixed findings for both SES groups. In general, failure to respond appeared to be less negative in high SES than in low SES schools, fitting in with some of the data described earlier to the effect that it is important for teachers in low SES schools to get a response but somewhat more important for teachers in high SES schools to keep lesson pace moving.

Taken together, the data on question difficulty and student answers suggest that an inverted-U shaped curve represents the relationship of these variables to student learning. This would indicate that medium difficulty levels of questioning are preferable and more beneficial than questions which are consistently too easy or too difficult. Furthermore, although the preceding statement holds for both SES groups, inspection of the raw percentages reveals that the optimal difficulty level is somewhat higher in high SES schools than in low SES schools, as might have been expected from the general tenor of the findings so far. The data suggest that the most successful teachers in the high SES schools have their questions answered correctly about 70% of the time, while the most successful teachers in low SES schools have their questions answered correctly about 80% of the time. Both of these figures are sufficiently different from 100% to contradict the reasoning of errorless learning advocates, although they do confirm the general idea that learning proceeds most efficiently when new material is quickly and easily assimilated into existing schemas without undue cognitive strain or difficulty. Thus, the findings seem to confirm the general suggestions of such writers as Ausubel, Hunt, and Bruner.

The 70% and 80% figures are also sufficiently different from 50% to disconfirm the usefulness of achievement motivation theory for conceptualizing this problem. Under game-like conditions, a probability of success of 50% tends to be associated with maximum achievement motivation among individuals who strive for success, while probabilities either near-zero or near 100% appeal more to individuals who fear failure. The present findings do not contradict these suggestions from achievement motivation theory so much as they demonstrate that several contextual factors are involved which make a difference between predicting the optimal difficulty level for a school learning situation vs. a game-like situation. First, students do not have much, if any, free choice about curriculum objectives; these are set by the school or the teacher. Second, the present data deal with cognitive activities, while most achievement motivation research has been conducted with skill performance in game-like situations. Third, achievement motivation theory discusses the relationship between probability of success to maximal achievement motivation rather than to maximal performance. It also notes that motivation itself (presumably including achievement motivation) is curvilinearly rather than linearly related to performance. Applying this to the present situation, we might predict that maximum achievement might be expected at either a 25% or a 75% difficulty level. The 75% level is around what was actually found. The 25% level might actually appeal more in terms of achievement motivation to individuals who have high needs for success and low fear of failure but apparently it involves too much cognitive strain or difficulty to allow efficient learning, even when motivation is high. In any case, learning was most efficient in high SES schools when about 70% of teacher questions were answered correctly, and was most efficient in low SES schools when about 80% of teacher questions were answered correctly.

The next set of data deal with teacher reactions to correct answers by students. The first variable, praise, yielded few significant relationships, and these were contradictory. In the first year there was a negative correlation between praise and learning in low SES, but this is contradicted by a primarily positively rising curve in the second year. More generally, the absence of significant relationships is part of a much larger picture revealing praise to be relatively unimportant, contrary to the attention given to it in most textbooks and by most theorists.

Criticism following correct answers was rare, as expected, although it did show some positive relationships with learning in high SES schools only. This is part of a broader pattern of positive relationships between criticism and student learning in the high SES schools. In general, high SES teachers who were most successful tended to be critical and demanding in responding to the academic efforts of their students, although in other respects they were generally warm and student-oriented.

As other data are discussed, a pattern will become clear indicating that praise, patience, and encouragement were associated with success in low SES schools, while demandingness and criticism were associated with success in high SES schools. This difference appears to be related to differences in the subject matter knowledge and motivation of the students and it probably also is related to the finding that high self-esteem individuals tend to respond more to challenge and criticism while low self-esteem individuals tend to respond more to relatively easier tasks and to encouragement and praise.

The failure to give feedback following correct answers was rare, as was expected, although the analyses that did yield significant results showed contradictory findings. In general, failure to give feedback was somewhat positively related to learning gains in low SES schools but generally had an inverted-U shaped relationship to learning in high SES schools. The latter was expected on the theory that feedback should be given most of the time. However, in certain circumstances, particularly during quick moving drills when most student answers are correct and the students have been conditioned to understand that non-response indicates a correct answer, failure to give feedback may not necessarily be harmful (or might even be helpful in that it would help the lesson move along more quickly). The positive trends seen in the low SES schools are inexplicable, however. Intercorrelations of this variable with other process measures and with presage measures will be inspected to see if some interpretation of its meaning can be developed.

Process feedback was too rare to allow meaningful analyses the first year. In the second year the data showed weak negative and strong and consistent positive associations with student learning in low SES and high SES schools, respectively. The positive relations with learning in high SES schools were expected, but the weak negative relationships in low SES schools were mildly surprising. It had been expected that process feedback would be one of the teacher reaction variables that would consistently correlate positively with student learning gains, but in low SES schools process feedback did not appear to be particularly facilitative. Perhaps the nature of the interactions was such that more was to be gained through maintaining brisk pacing by quickly giving an answer and moving on. This could allow more repetition and redundancy to be built into the lesson instead of stopping and giving an extended explanation to one student and perhaps ruining lesson pacing and losing student attention.

Asking a new question following a correct answer showed contradictory relationships. In the first year this was strongly negatively correlated with learning in low SES schools but interactions in the reading group reversed this pattern. The second year revealed a single positive correlation for low SES in morning interactions (contradicting the finding for the first year) and some weak curves for reading groups. In general, these data are not very interpretable given the contradictory findings and the nature of the variable. New questions included too many different kinds of possible new questions, and apparently two or three or four different kinds of things were included in it so that the relationships are somewhat ambiguous. In future research, coding of this variable should be adjusted to differentiate new questions which involve attempting to get the student to expand upon his answer or transfer his thinking to a more complex level, and other kinds of new questions that might involve changing the subject or switching from academic questions to self or opinion questions.

As a set, the data for teacher responses to correct answers hung together well for high SES but not for low SES (as is frequently the case in these data). They revealed that teacher criticism and particularly process feedback following correct answers was associated with student learning gains. The data for low SES were mixed and generally confused. They failed to support expectations or to indicate any particular teacher behavior that was regularly associated positively with student learning gains, although they disconfirmed several expectations based upon existing literature.

The next set of data deal with teacher reactions to part-correct answers by students. The data in this set are very sparse because part-correct answers were rare. Giving students the answer was generally positively related to learning, although most relationships were curvilinear and only one or two were strong. Calling on someone else showed a single inverted-U relationship in high SES and an uninterpretable weak U-shaped relationship in each SES group. Having other students calling out the answer following part-correct answers showed no data in any of the three contexts. Repeating the question showed a few generally positive but curvilinear relationships. Rephrasing or giving a clue showed generally positive relationships in low SES but generally negative ones in high SES. The same was true for asking new questions.

The data in this set are difficult to interpret with confidence because part-correct answers appeared infrequently and also because some part-correct answers were mostly correct while others were only correct to a minor degree. One variable that came through as effective in these situations was giving the student the answer. This was mildly surprising in that it was expected that sticking with the student and trying to get him to come up with the answer on his own would be the most ideal teacher reaction. This was in fact helpful as a rule for low SES students, but it was negatively related to learning for high SES students. We believe that the latter is because at this grade level the majority of questions were product or simple fact questions which required the student to respond with a single word or brief phrase from memory. Many of these questions were of the sort that students either knew or did not know how to answer. Consequently, if the student failed to answer the question correctly after a second or two, he was unlikely to benefit from additional time or from teacher attempts to provide clues. This interpretation assumes that the student has answered the best he could however, and other data suggest that this may often have not been the case in the low SES schools. It seems likely that many of the part-correct answers from these students were halting and tentative responses rather than responses that the children stated loudly and confidently. Under these circumstances, the children would be in a position to benefit from teacher encouragement in the form of sanctioning the correctness of what they have said so far and encouraging them to continue and finish the response.

The next set of data deal with teacher responses to wrong answers (i.e., situations in which the child makes a response but the response is clearly incorrect). Praise did not occur frequently enough to allow analyses in either year, although occasionally a teacher would praise a child for making a good try even though his answer was incorrect. Criticism was also very infrequent and allowed analyses only during second year. In the afternoon interactions there was a single weak negative relationship between criticism of wrong answers and learning gains in low SES. In reading there was a pattern of negative relationships in low SES and rather strong positive relationships in high SES. This is another example of the kind of critical demandingness that the more successful high SES teachers revealed compared to all other teachers.

Failure to give feedback was also very rare when a student gave a wrong answer, and the places where it occurred often enough to allow analyses (morning data for year 2) failed to reveal any interpretable relationships.

Process feedback was not frequent enough to allow analyses the first year, but the second year some relationships appeared. There was a single negative correlation between process feedback and learning gains for high

SES in the morning data, some weak and mostly inverted U-shaped curves in low SES and some weak and uninterpretable curves in high SES in the afternoon data, and no significant relationships in the reading group data. Thus, in contrast to the data in other situations, process feedback following wrong answers did not appear to be an effective teacher response.

The next data concern giving the student the answer. In the first year this did not occur frequently, although some relationships appeared. In the first year, the morning data revealed positive associations between giving the answer and student learning in high SES. There were not enough data to analyze for the afternoon in high SES, while the data for low SES in the afternoons yielded mostly uninterpretable curves. Finally, the data for the reading group in the first year yielded mostly negatively sloped curves in low SES but inverted U-shaped curves in high SES. For the second year, the morning data revealed negative relationships in high SES and weak and mixed data in low SES in the mornings, no significant data in the afternoon, and a dropping curve for low SES and a rising curve for high SES in reading group.

Thus, taken together, the data for giving the student the answer provide mixed and somewhat confusing findings. As is typically the case the data for low SES in particular do not hang together in a clear-cut pattern. The data for high SES are not completely consistent either, although the general tendency indicates that giving the answer following wrong answers was for the most part an ineffective method of dealing with wrong answers, although this relationship was mostly curvilinear rather than linearly negative.

The next variable deals with calling on someone else. In year 1 this method of dealing with wrong answers was negatively correlated with learning gains in low SES for the two significant correlations that appeared. The data for high SES suggested weak positive relationships. In the second year, the data again revealed mostly negative correlations in low SES and positive ones in high SES, but the latter again were notably weaker. Also, the data for reading groups were not as clear-cut and did not fit together with the data for general class as well. In general, then, calling on another student to give the answer was generally negatively associated with learning in low SES, but positively, though mildly, associated with learning in high SES following wrong answers by the original respondent.

The next variable deals with situations where the teacher did not get a chance to give feedback or to ask another question because another student called out the answer. This was rare both years, although a few relationships did appear. In the first year there was a single negative correlation between callouts in these situations and learning gains in low SES. In the second year there were no interpretable relationships. One multiple regression analysis did reach significance and revealed a positive linear slope in low SES, but the zero-order correlation was not statistically significant. Thus, in general, calling out by other students was not a major problem following wrong answers, but to the extent that it was, it seemed to be negatively correlated with student learning gains, particularly in low SES schools.

The next variable concerns repeating, rephrasing, or asking new questions. This combined some of the more specific variables dealt with below, so it will not be dealt with in detail, except to note that as a general rule it is more effective in low SES than in high SES schools.

More specifically, repeating the question (that is, asking the student again to respond to the original question without giving him any help) was mostly negatively correlated with learning gains in both groups, particularly in high SES schools. There are also a variety of types of curvilinear relationships, although most of these also reveal primarily negative relationships. This is the first of several sets of findings showing that simply repeating the question when the student has not answered it the first time is not very effective, as might be expected. Given the nature of the questions asked at this grade level (mostly factual questions which the student will answer quickly if he knows the answer but is not likely to answer if he doesn't come up with the answer quickly), repeating the question without giving help amounts to a kind of "pointless pumping" of the student. Without help, he is unlikely to improve upon his original response.

The contrast is shown somewhat in the data for the next variable concerning rephrasing or giving a clue, which includes most of the situations where the teacher tried to get the child to improve his response by giving him some help. Although few relationships were significant, it is clear that this was an effective strategy for teachers in low SES schools. The data for high SES schools are weak and uninterpretable, however. This is worth noting, though, because this is one of the relatively few instances in which a teacher behavior clearly correlates positively and consistently with student learning gains in low SES schools. Thus, when a student in a low SES school gave a wrong answer, it was helpful for the teacher to stick with that student and try to get him to come up with the right answer by rephrasing the question or providing some kind of clue or help, as opposed to giving him the answer or moving on to someone else. This finding may seem puzzling to those who would have expected the opposite SES difference on the grounds that the higher SES children would be more likely to benefit from help and improve their response. We believe that the data result from a difference in the style of responding by the two SES groups. More of the wrong answers that came from low SES students were blurted out impulsively or were simply wild guesses, so that teacher persistence in seeking a better response was more likely to succeed and also was helpful in conditioning the children to learn to think before responding.

The last variable deals with teacher asking a new question following a wrong answer. This variable is a somewhat mixed one, since some new questions involved rephrasings or simplifications of questions (such as switching from "what color is this?" to "Is this red or blue?"), while other new questions were switches from academic questions ("What color is this?") to non-academic questions ("Did you do your work?" "Did you hear the question?"). Thus, interpretation of this variable is somewhat tenuous. In any case, the data reveal that the behavior was relatively infrequent both years, and that it was mostly positively, but somewhat curvilinearly, associated with learning gains in low SES schools and showed mixed but mostly negative relationships in high SES schools. Here again, it was more helpful for teachers to stick with the student and ask another question if he was in a low SES school than if he was in a high SES school.

The next set of data deal with teacher reactions to situations where children say "I don't know" or make no response at all. These will not be discussed in much detail because they are discussed more specifically in the following two sections. It is noteworthy, however, that these data were infrequent in general, indicating that situations in which students said "I don't know" or made no response to teacher questions were relatively infrequent in the observations.

The remaining data are rather sparse, but they suggest that calling on someone else was negatively associated with learning gains in low SES schools but positively in high SES schools; that having another student call out the answer was slightly positively associated with gains in low SES schools but fairly strongly negatively associated with gains in high SES schools; and that providing some kind of help or repeating the question was generally positively associated in low SES schools and negatively in high SES schools. These will be discussed more specifically in subsequent sections.

The next section deals with teacher reactions when a student stated "I don't know," or words to that effect, when asked a question. Data in Year 1 for this set of variables are not available. The student response of "I don't know" and the no response category were combined and were not analyzed separately. Separate analyses are shown for year 2, however. Criticism in this situation occurred very rarely and showed no significant relationships to student learning. The same was true of failure to give feedback and of giving the answer. Teachers sometimes gave the answer when the student gave a wrong response, but they tended to do more than simply give the answer when the student said "I don't know." In these situations they were more likely to stick with the student and try to get the answer or to call on someone else, at least in high SES classrooms.

Calling on someone else was a relatively infrequent teacher response to the situation. It showed no significant relationships in year 1. The year 2 data show it to be negatively associated with learning gains in the low SES schools but positively in high SES schools. This is one of a pattern of findings suggesting that it is important for the teachers in low SES schools to stick with the student that they originally called on and get some kind of response from him. In the high SES schools it appears to be more important for the teacher to get the answer and less important that she get the answer from the original respondent. Apparently, students in high SES schools can learn as well from hearing answers given by other students as from giving the answers themselves. Also, when students said that they did not know the answer in high SES schools, this was usually an accurate statement of the situation, whereas in low SES schools this response could have meant that the student was unwilling to respond or was inhibited about responding because he was unsure. Thus, in these situations teachers in low SES schools were more likely to get the answer through persistence, but in high SES schools, attempts to get the answer from a student who said that he didn't know amounted to pointless pumping.

Having another student call out the answer did not occur very frequently. Data were so infrequent in the second year that no analyses could be run. Thus, student callouts were particularly infrequent in situations where the student replied "I don't know."

There were not enough data for analyses in low SES and for the most part in high SES in the second year for repeating, rephrasing and asking new question, although analyses were run for the whole class interactions in the mornings. These yielded significant negative correlations with student learning gains in high SES, further supporting the idea that attempting to get the student to respond in high SES schools after he has already stated that he doesn't know the answer tends to be an ineffective tactic. The more specific data on repeating the question vs. rephrasing or giving a clue vs. asking a new question all happened so infrequently that meaningful data analyses could not be run. This was essentially because there were relatively few instances of students saying "I don't know" in the first place.

The next section deals with teacher reactions in situations where a student fails to answer the question but remains silent. Again, criticism, failure to give feedback, and giving the answer were all infrequent responses. Only giving the answer yielded a significant finding, and this was a weak and uninterpretable curve. Thus, these three teacher responses were infrequent and unrelated to student learning in situations where the student failed to respond.

Calling on someone else shows the same relationship noted earlier; it was negatively associated with learning in low SES schools but positively in high SES schools. Again, it was important for low SES teachers to stick with the original respondent and work to get some kind of answer, while in high SES schools it appeared to be more important to move along and get the answer, not necessarily from the original student.

Other students calling out the answer were somewhat more of a problem in cases of no response than in cases where the original respondent said "I don't know." In the second year the data suggested weak positive relationships in the low SES schools and weak negative ones in the high SES schools. The general weakness of the data appears to be a function of their infrequency; student call outs were relatively infrequent even in this situation, essentially because teachers did not allow them.

Repeating, rephrasing, or asking a new question showed no significant relationships in either year for whole class interactions in the mornings. In the data for afternoons, the second year findings show a tendency toward positive correlations in low SES and negative correlations in high SES, although some of the relationships are curvilinear. Similar findings, although less frequent ones, appear for repeating the question and for rephrasing or giving a clue. The data for asking new questions did not produce significant relationships. Thus, in general, the data on teacher reactions in situations where the student made no repsonse at all to the original question hang together consistently. They showed that student learning gains were higher in low SES schools when the teacher stayed with the original student and worked to get a response, but the student learning gains were higher in high SES schools when the teacher moved on and called on someone else. A student who failed to respond or who said "I don't know" in high SES schools usually did not answer the question or improve his response when the teacher persisted in dealing with him.

The next section deals with teacher reactions combined across all response opportunities (correct answers, wrong answers, part-correct answers, "I don't know" answers, and failures to respond). These data will not be discussed, since they combine the more specific data that have already been reviewed. The trends already discussed are evident in the data from this set, for the most part, although occasionally some contrasting findings appear because the data for teacher responses to correct answers have been lumped in with the data for teacher reactions when the child has failed to give a correct answer.

The data for praise and criticism are worth noting, however. The praise data, as elsewhere, reveal sparse findings, and the findings that did reach statistical significance are largely contradictory. Praise showed two positive and one negative relationship to learning gains in low SES, and three inverted-U curves of varying steepness in high SES. Thus, the data reinforce the more general tendency found throughout the study that teacher verbal praise is not particularly important at these age levels. Data from child development research suggests that verbal praise (as opposed to other kinds of rewards) from female adults (and all the teachers involved in this study were female adults) is a relatively weak reinforcer for children of these age levels, and this may explain the findings in part. Despite the stress on the importance of praise in textbooks, verbal praise does not appear to be a very important correlate of student learning gains. However, we do *not* wish to imply that praise should not be given; the lack of significant findings may indicate the teachers were praising sufficiently rather than that praise was unimportant. Also, behavior modification studies have revealed that contingent praise is more effective than non-contingent praise. It may be that the teachers were failing to praise contingently and thus were not making their praise as useful or effective a reinforcer as they might have if they had praised more effectively. These are but two possible interpretations and qualifications of the praise data. In any case, the lack of positive support for praise does not necessarily indicate (and it should not be inferred) that praise is unimportant or should not be given.

The criticism data are notable in that they again show positive relationships between criticism and student learning gains in high SES schools, and also because they show the negative relationships between criticism and student learning gains in low SES schools. Here again we see the pattern of criticism and demandingness in the high SES classroom teachers who got the best learning gains, but a pattern of praise and encouragement on the part of low SES teachers who got the best gains.

Other variables in this set reinforce the data noted earlier. Generally, when the original student failed to respond, the more successful teachers in high SES schools tended to give the answer or call on someone else, while the more successful teachers in low SES schools tended to stick with the original respondent and provide some kind of help in an attempt to get him to answer.

The next section deals with the frequency of student response opportunities. This is, in effect, a measure of the amount of classroom time devoted to public question and answer sequences as opposed to seatwork or other kinds of non-public learning situations. The data for the first year revealed a consistent pattern of negative correlations in low SES and positive correlations in high SES for the morning. The afternoon data were more mixed,although the positive correlations in high SES were consistent. The reading group data yielded no significant relationships. This was interpreted last year as an indication that indirect teaching is inappropriate for low SES students at this grade but more appropriate for high SES students. It was also considered an indication that students who are still working on mastering tool skills need more time devoted to demonstration and practice of such skills and will not benefit as much from verbal discussion until they have mastered these tool skills. The findings were generally not replicated the second year. There was one significant negative correlation between this variable and student learning gains in low SES schools, along with a number of generally weak and uninterpretable curves from the reading group data. Thus, the negative relationship for low SES schools was replicated, but for only one of a possible 15 analyses, and the consistent pattern of positive relationships seen for high SES schools in first year did not reappear in the second year. These relationships were not negative, but neither did they indicate any consistent positive relationship between this variable and student learning gains in the high SES schools. Thus, the general comment that verbal interaction is contraindicated for low SES students still concentrating on tool skills holds up, but the support that appeared for verbal interaction in the high SES schools in the first year data do not appear in the second year data.

It is worth noting in this regard that in the second year of the study the school district involved was in the process of introducing learning centers, and most teachers were devoting time and effort to this endeavor. Consequently, there was much more individualized activity going on in learning centers in all of the schools during the second year of the study, but particularly in the high SES schools. This probably affected the correlations for this variable in some way, although it is difficult to guess exactly what the effects might have been. If anything, we might have expected it to accentuate the positive correlations between verbal interactions and learning gains in the high SES students, because learning center activities were mostly individualized and did not involve this kind of verbal interchange, but this clearly was not the case.

Probably the most important and most general interpretation of these data is that verbal interchanges are simply less relevant to instruction for young children in the early elementary grades than they are at higher grade levels, where more time is spent in verbal discussion of symbolic materials. This set of data in particular, and the findings for this project as a whole, also indicate the need not only for research on teaching in the early elementary grades but for conceptualizing it and discussing it in textbooks as a qualitatively different process from teaching at higher grade levels. Teaching in the early grades is in many ways qualitatively different from teaching at the later grades, where more reliance is placed on verbal interchange. It is beginning to appear not only that research on teaching in early grades must involve somewhat different variables and coding systems than research in latter grades, but that teacher preparation for teaching in early grades must involve training in different kinds of skills than teaching for later grades.

The next set of data deal with student initiated questions. Beginning here, discussion switches from public response opportunities initiated by the teachers to response opportunities that occurred because the students initiated them by asking a question or making a comment. As can be noted from the tables, these were relatively infrequent, although other studies indicate that student initiated questions and comments occur much [illegible] frequently at higher grade levels.

The data for student initiated questions revealed few analyses that could be done, and even those which were done are of little usefulness because they yielded mostly uninterpretable curves. For the most part, they showed the variables related in inverted-U fashion to student learning gains, although curves were infrequent and usually weak. It is worth noting that relevant student questions did not appear to be systematically better than irrelevant student questions, although this must be taken in the more general context of the low frequency of questions of any kind. If student initiated questions, particularly irrelevant ones, had been more frequent, it seems reasonable to hypothesize that negative relationships would have occurred for the percentage of such questions which were irrelevant and for the percentage which were called out. These did not appear, however, probably because student initiated questions were rare at these grade levels.

The data for teacher reactions to relevant student questions were sparse, although brief feedback to such questions showed mixed correlations in low SES but rather consistently positive relationships in high SES. Long feedback yielded consistently negative relationships in high SES in the first year, but the data were mixed in the second year. In general, these data on teacher responses to student initiated questions are not very interpretable, both because of their low frequency in the first place and because of their contrasting and contradictory pattern of correlations with learning gains. There is a fairly general pattern suggesting that brief feedback was superior to long feedback in the high SES classrooms, but there were occasional exceptions to this pattern. The data for low SES schools were completely mixed and contradictory.

It is noteworthy that neither behavioral warnings nor criticism following relevant student initiated questions were frequent enough to allow analysis. This indicates that the teachers as a group were receptive to such student initiated questions.

The data on teacher responses to irrelevant student initiated questions did not allow analyses because these questions were so infrequent.

The next section deals with student initiated public interactions (comments and questions directed to the teacher) over total response opportunities. This index indicates the fraction of each student's public response opportunities which were comments or questions initiated by himself as opposed to recitation opportunities or attempts to answer questions posed by the teacher. In general, this variable showed weak positive relationships in low SES schools and stronger negative relationships in high SES schools. Although a variety of interpretations are possible, consideration of the data as a whole lead us to believe that this is one indication of a pattern in which student initiation and willingness to discuss academic material with the teacher was infrequent in the low SES schools (hence, the positive correlations), while it was frequent in the high SES schools, perhaps even to the point of over eagerness and unhealthy competitiveness (hence, the negative correlations). In any case, the data for this variable provide little support for the idea that student initiated interactions are somehow superior to teacher inititated interactions, or that they represent an index of desirable and positive student motivation. The data for the high SES schools suggest that they may represent undesirable competitiveness or a relative absence of sufficient controls over the flow of classroom discussion by high SES teachers.

The next section deals with student initiated comments (as contrasted with student initiated questions described earlier). These were also relatively infrequent, but they were more frequent than student initiated questions and thus allowed more analyses to be performed.

The percentage of such comments which were relevant showed strong positive correlations in the morning interaction in the first year for low SES schools, but no significant relationships in the high SES schools. However, the afternoon data revealed negative relationships for both schools, significantly for high SES. The reading group yielded no significant relationships at all. In the second year, the data revealed weak and mixed findings, with the exception of one significant negative correlation in the reading group for low SES schools, ~~but a consistent~~ pattern of positive correlations for high SES schools. Thus, the data on this variable are largely contradictory from year one to year two. However, the preponderance of significant correlations were positive, as expected. The occasional significant negative coefficients serve as a reminder that student initiated comments can sometimes be beneficial even when they are not relevant to the topic under discussion, although the broader pattern of data suggest that relevant comments are more helpful than irrelevant comments.

The data for the percentage of student initiated comments which were called out by the students (as opposed to comments made after they had raised their hand and recieved recognition from the teacher) showed the preponderance of negative relationships to student learning gains, which was expected. However, in the first year there were a few positive relationships in the high SES classrooms. In general, these data fit the expectation that called out comments would correlate negatively with learning gains because they probably represent deficient classroom control on the part of the teacher. However, this was more of a problem in low SES schools. In high SES schools, where more of the called out student comments were relevant and appropriate, called out comments occasionally correlated positively with student learning gains.

Unfortunately, praise of relevant student initiated comments was too infrequent to allow analysis. This is one place where praise would seem to have been particularly appropriate, but it did not occur very often (although student initiated comments themselves did not occur very often, either).

Also, unfortunately, failure to give feedback to relevant student initiated comments occasionally did occur often enough to allow analyses. Although there are some exceptions, this teacher failure was negatively associated with student learning gains in low SES schools, as expected. In high SES schools it did not happen enough to allow analysis. Thus, when a student made a relevant comment, it was important that the teacher provide him with some feedback, at the minimum letting him know whether his comment was appropriate or not.

Delaying student initiated comments did not occur often enough to allow analyses in either year. Refusing to except such comments (informing the student that this was not the time for comments or that his comment was not relevant and would not be taken up at the moment) yielded mostly curvilinear findings, as expected. Taken together, the data suggest that this variable correlates in an inverted U fashion to student learning gains, with teachers who are generally receptive to student comments, but who place some limits and types of such comments by refusing to accept them in certain contexts, being more successful than teachers who are less receptive to such comments or who allow any kind of comment at all regardless of appropriateness.

The next variable deals with the percentage of student initiated comments which was accepted by the teacher (the student was informed that his comment was appropriate and that the teacher agreed with it or at least thought that it was a good idea). The data for this variable are similar to those for the previous variable, showing several significant relationships but a generally mixed and somewhat contradictory pattern. The general relationship appeared to be similar for the previous variable: teachers who accepted a certain optimal type and frequency of relevant student initiated comments did better than teachers who did not accept such comments or who were overly accepting of virtually any comment that a student made. In addition, the data for this variable suggest that acceptance of student initiated comments was more positive in its association with learning gains and generally more important as a variable in low SES schools than in high SES schools, where most significant correlations were negative. This supports a more general pattern suggesting that it was important for low SES teachers to encourage their students to participate in discussion and to model a willingness to listen to what they had to say. However, in high SES classrooms it appeared important for the teacher to maintain some control over the flow of interaction, since overeagerness to respond and perhaps a certain amount of unhealthy competitiveness seemed to typify the interaction in these classrooms.

The data on the percentage of relevant student initiated comments which was integrated into the discussion topic by the teacher showed the expected positive correlations for the most part, although the data are much weaker than might have been expected on the basis of literature suggesting that this is an extremely important teacher variable. Again, we suspect that the findings are another example of the difference between teaching in the early elementary grades and teaching at higher levels where variables directly concerned with action and reaction in verbal interchanges during class discussion become more important.

The percentage of relevant student initiated comments which caused a shift in topic did not appear with enough frequency to allow meaningful analysis.

Thus, in these grades at least, teachers do not allow student comment to shift the topic of a discussion very frequently.

The data on behavioral praise following student initiated comments showed that this never occurred in either year, although this would have been a good opportunity for teachers to congratulate and generally encourage students for making such comments. Thus, in general teachers failed to praise relevant student initiated comments. This was true for both making comments per se and for the quality of the comment itself.

More positively, behavioral criticism was also totally absent in response to student initiated relevant comments and behavioral warnings occurred so infrequently that meaningful analyses could not be done. Thus, although teachers did not take the opportunity presented to them to encourage the students when they made relevant comments, neither did they criticize or warn them for speaking out of turn or for taking the initiative in a discussion.

Irrelevant student initiated comments were never praised, as expected. Other data on irrelevant student initiated comments are sparse, essentially because these comments themselves were infrequent. A single significant correlation indicated the positive relationship between refusing to accept an irrelevant student initiated comment and student learning gains in high SES. This was paralleled by a mostly negative curve for acceptance of irrelevant student initiated comments in high SES. However, in the reading group there was a positive association between acceptance of irrelevant student comments and student learning in both SES groups. Thus, the data, while generally weak and sparse, suggest that acceptance of irrelevant student initiated comments may be positively associated to learning in low SES schools, although in high

SES schools it seems to be more appropriate for the teacher to establish rules about acceptable and unacceptable student initiated comments rather than accept anything that students decide to contribute to a discussion.

As expected, irrelevant student initiated comments were neither integrated into the discussion topic nor used to shift the topic. Also, they were not praised, as expected. They were also not criticized, however, and teachers did not warn students in a negative way for making such comments. Thus, teachers seem to be aware of the positive aspects of student initiated comments, even when they were irrelevant. They did not praise them or shift the topic in response to them, but neither did they warn or criticize students against such comments in the relatively few instances in which they were observed.

The next section deals with self and opinion questions. Self questions had to do with personal likes and dislikes, personal experiences, and other matters that had little or nothing to do with the curriculum. Opinion questions solicited the student's opinion on some matter. Many had to do with the curriculum, but in these cases there were no right or wrong answers as was the case with clearly academic questions (process questions, product questions, or choice questions). Self and opinion questions tended to occur during social interactions between teacher and the students, although often they were used as lead-ins to discussions (for example, the teacher might introduce a lesson on animals by asking one or more students if they had been to the zoo and about what they saw there).

The percentage of self questions relative to the percentage of academic questions showed consistently negative relationships to student learning gains in the first year, but in the second year the data revealed weak and uninterpretable relationships for low SES and mixed but primarily positive relationships for high SES. Negative correlations had been expected on the theory that learning gains would be greatest when the greatest amount of time was spent in direct discussion of curriculum relevant material, but this predication was borne out only for the first year data. The reasons for the positive relationships between the percentage of self questions and learning gains in high SES schools in the second year remain unknown.

The proportions of self questions which were subject matter related showed not enough data to allow analyses in the first year. The second year data revealed the expected positive relationships in low SES, but weak and mixed data in high SES. Similarly, the proportion of self questions related to personal preference had no data the first year. The second year data show mixed relationships between this variable and student learning gains in both SES groups.

Thus, the general variable of self questions and the more specific matter of whether self questions were related to the curriculum in any way or whether they simply dealt with personal matters was not systematically or consistently related to student learning. Several significant relationships appeared, but they often were either uninterpretable or contradictory. This is most probably because the category of self questions includes a broad range of different kinds of questions and thus probably is too crude in general a category to be meaningfully interpreted.

The next section deals with opinion questions. The frequency of opinion questions relative to academic questions with clear-cut or wrong answers showed one inverted U relationship and two significant negative correlations for high SES in the first year. In the second year the data showed mixed but mostly positive relationships for low SES and consistently negative but relatively weak relationships for high SES. These findings contradict both our own expectations and the general literature which tends to favor opinion questions as one method by which a teacher can motivate students and get them to "think for themselves" about the subject matter at hand. Instead of the expected positive correlations, the data reveal only weak positive relationships for low SES students and consistently negative relationships for high SES students. The discrepancy is probably due in part to the fact that we were studying second and third grade children, whereas most studies supporting opinion questions were done with older children. Also, it should be kept in mind that our learning gains criteria are such that teachers who stuck with curriculum relevant questions would generally be likely to do better than teachers who wandered from the specific curriculum goals into related but, nevertheless, different areas. In this context, it is worth noting that the successful high SES teachers tended to stick to the curriculum and materials provided them, whereas the successful low SES teachers tended to supplement or substitute these materials.

The teachers never failed to give feedback to a student who had expressed his opinion. However, as was the case with student initiated comments, they rarely praised an opinion given by a student. However, the few analyses that could be run suggested that such praise was important. It was strongly positively correlated with student learning gains in low SES students (the only one of the two groups for which analyses were available). This is one of the few instances of praise which showed clearly positive and strong correlations with student learning measures. Reasons for this are unknown, although it seems likely that praise of student opinions would be more likely to be genuine and to be experienced as reinforcing and motivating than the perhaps more perfunctory praise given to correct responses to academic questions. In any case, praise following student opinions was not only positively associated with learning gains in the low SES students, but was correlated more strongly with gains than was praise following correct answers to academic questions.

Criticism of student opinions was rare. No data in this category were available for the first year, and in the second year, frequencies were too low to allow analyses. The same was true for failure to give feedback to student opinions. Also, teachers very rarely disagree with student opinions. This seems appropriate at this grade level, when opinion questions are intended largely as motivational devices and "discussion starters," as opposed to opinion questions asked of older students under circumstances where disagreement with the student's opinion (exprassed without derogation of the student, of course) might be a useful and productive teacher response.

The proportion of student opinions which was simply accepted without much commentary by the teachers was low, and did not yield interpretable findings. The percentage of student opinions which was intagrated into the discussion topic was even lower, never occurring enough to allow analyses. This is further evidence that opinion questions are used largely as motivating devices at these grade levels, as opposed to higher grade levels where the teacher is more genuinely interested in soliciting a cognitive and reasoned opinion from the student concerning a complex question under discussion.

In summary, self and opinion questions were relatively unimportant as correlates of student learning gains in this study, apparently because of the age of the students and the grade level involved. Much of the classroom time is spent in demonstration and practice of tool skills in these early grades, and even the verbal interchanges which do occur are confined almost exclusively to question and answer sessions and discussions dealing with low level factual matters that have clear-cut right or wrong answers. Consequently, opinion questions are much less relevant and important than they are at higher grade levels when students begin to deal with more abstract matters and to discuss questions that have no simple right or wrong answers.

The hundred-thirty-one (131) variables discussed so far have all dealt with aspects of public response or recitation opportunities. We now turn to private contacts in which the teacher is interacting with an individual student only and where the interaction concerns the student alone and not the class as a whole. These interactions are labeled "private" because they deal with the individual student's needs or behavior, although some of them are carried on loudly enough so that other members of the class or even as the class as a whole might hear them. Nevertheless, the interaction is intended by the teacher to concern only the individual student with whom she is dealing, and is not meant as a teaching vehicle or managerial message to the class as a whole.

The percentage of private contacts which was student initiated (vs. teacher initiated) showed mixed findings rather than the positive correlations which had been expected. The general trend was toward negative relationships in low SES and positive ones in high SES, but there are several exceptions and qualifications to this statement. As with a number of other variables which have been positively related to student learning gains in studies done at higher grade levels, the present variable appeared to be relatively unimportant as a correlate of student learning gains with these second and third graders. The

SES difference, to the extent that it is genuine, probably represents a difference in the general proclivities of the teachers in these two types of schools. The low SES teachers in general were particularly open to student initiated contacts, and thus the tendency toward negative correlation probably resulted from the classrooms of teachers who were too open and who therefore had control and management problems. Conversely, the high SES teachers tended to be, if anything, somewhat less open to student initiated contacts, so that the positive correlations which tended to appear for this group are probably reflective of this. Also, in general, relatively more of the student initiated contacts in low SES schools dealt with procedural or behavioral matters rather than with work related matters.

The percentage of student initiated work contacts which led to praise from the teacher showed mixed, but mostly negative, correlations with student learning gains. These data fit fairly well with other data involving teacher praise, including praise during teacher initiated work contacts. One exception, however, was praise of opinions given by the students following opinion questions asked by the teachers. Praise in this case was positively correlated with gain especially in low SES.

In addition to this difference in the nature of praise itself, it is possible that the negative correlations for praise occurring in student initiated work contacts appeared because much of it was directed at teacher dependent children who may have been overly responsive and in need of teacher praise to the point where they came to the teacher to show off any and all work. If this is true, it may also be true that teachers who were higher on praise in these situations were teachers who failed to recognize what was happening and who, in general, were more open to having their own behavior conditioned by the activities of the children instead of vice versa. In short, high rates of praise in student initiated work contacts (particularly if accompanied by relatively low rates of praise in other contextual situations), may indicate the teacher's lack of awareness of the student's dependency on her, and she may reinforce this dependency unwittingly.

Student initiated work contacts involving criticism were infrequent the first year, with the only significant relationship being a negative correlation in low SES. The second year data reveal generally negative relationships in low SES and generally positive relationships in high SES. This fits with the pattern for criticism noted in the public response opportunity data to the effect that criticism is negatively associated with learning gains in high SES. This has already been discussed at some length.

The percentage of private work contacts (as opposed to contacts dealing with procedural matters) which were initiated by the student (as opposed to the teacher) showed a mixed pattern of relationships rather than the expected pattern of positive correlations. The first year data did reveal generally positive relationships (although most were relatively weak and somewhat curvilinear), but the second year data revealed weak positive relationships in low SES and weak negative relationships in high SES. Note that this pattern conflicts with the measure described earlier (# 132) dealing with the percentage of total private contacts which were student initiated. Taken together, these data indicate that in the low SES schools high rates of student initiation of work related contacts were mostly positively related to student learning gains, while high rates of student initiation of procedural contacts were mostly negatively related to student learning gains. In short, the low SES students learned best when they came to the teachers for help when they needed it, but not when they continually came to the teacher to ask questions about procedural matters rather than to get help with their work. These data from the low SES schools bear out expectations. However, the data from the high SES schools do not hang together very well and are puzzling. The first year data suggest that the percentage of private work contacts which were student initiated was generally positively related to learning gains, but the second year data suggest the opposite. Neither set of data involves very strong relationships, so that perhaps the most that should be said is that this variable is not a very important correlate of student learning gains in the high SES schools.

The following set of variables concerns teacher behavior when students initiated individual contacts with them. Delaying dealing with the student (telling him to come back later or to wait until the teacher had a chance to go to his desk and deal with the problem) showed mixed relationships in both SES groups. The data for low SES indicate a general inverted U relationship for this variable, suggesting that delay was sometimes appropriate and that this was a frequent problem in low SES schools. The data for high SES schools are generally positive except for a significant negative correlation in the first year, indicating that in general delay is even more appropriate in high SES schools, although again the data are neither completely consistent nor particularly strong in some instances. Most likely, the appropriateness of delay depends on what the teacher is doing at the time. If a student is seeking the teacher's attention in the middle of a reading group or other activity which would be unwise to interrupt, delay is probably appropriate. In contrast, if the teacher has nothing more important to do, it is probably appropriate to deal with this student's need at the moment. Other data suggest that, at a more general level, the most successful teachers minimize such delays by developing specific rules about when students can or should approach them for help. They also provide alternative ways in which students can get help during times that they are not supposed to interrupt the teacher. The less successful teachers who lack such rules and procedures are often interrupted continually by students seeking individualized help, sometimes to the point that their group lessons are ineffective because of these constant interruptions.

The next two variables concern brief vs. extended feedback to students who initiate interactions. The data on brief feedback indicate generally inverted U relationships, although there are some exceptions. The data on long feedback suggest positive relationships for low SES and negative relationships for high SES the first year, but these are not replicated the second year. Here again, the confused findings are probably due to failure to take into account context and appropriateness. It seems likely that extended feedback would be appropriate in situations where the student does not understand the material and needs an extended explanation and where the teacher has the time to give it to him. In contrast, brief feedback would be more appropriate where the student only needs a quick answer to a specific question and/or where the teacher does not have the time to interrupt something more important in order to provide extended feedback to a student at the moment.

The next variable deals with the percentage of student initiated contacts which involved personal concerns of the student (as opposed to work related interactions). In the first year, this variable yielded mixed findings for low SES but consistent and rather strongly negative correlations for high SES. However, the second year data revealed weak and mixed curves in both SES groups. Thus, the first year data confirmed the expectation that high percentages of student initiated contacts which involved personal concerns rather than academic work would relate negatively to student learning, but these relationships do not appear in the second year. We do not know why these first year findings did not replicate in year 2.

Student initiated requests which were granted by the teacher showed a tendency toward negative relationships in low SES and consistently positive relationships in high SES the first year. In the second year, the data on this variable were more sparse, but this time the low SES data were mixed and the high SES data were consistently positive. The meaning of this is not unambiguously clear; however, it seems likely that the SES difference reflects the difference in the nature of student requests. That is, it seems probable that high proportions of student requests in the high SES schools were appropriate, and thus it was appropriate for teachers to grant time. In contrast, it seems likely that a sizeable percentage of student requests in low SES schools was inappropriate or unfeasible, hence the negative correlations in this SES group.

The percentage of student initiated requests which was delayed (the teacher ultimately grants the request but makes the student wait for some reason) showed mixed but mostly positive relations in low SES and mixed but mostly negative ones in high SES. Again, this probably reflects differences in the nature of the student requests.

Student initiated requests which were not granted by the teachers showed mixed data in low SES and a tendency toward inverted U relationships in high SES. The high SES curves were primarily negative, however, fitting with the data reported above.

In summary, data concerning granting vs. delaying vs. not granting student initiated requests suggested that the student initiated requests in high SES schools were probably more consistently feasible and appropriate than the students' requests in low SES schools, and consequently that granting of such requests tended to be positively associated with learning gains in high SES schools but negatively associated with learning gains in low SES schools.

The data on percentage of student initiated contacts which involved sharing personal experiences (i.e., basically social interactions with the teacher) were not collected the first year. In the second year, the coding system was revised to include this variable. There was a significant positive correlation for low SES and several negative relationships for high SES. This fits in with the general pattern to the effect that successful low SES teachers were warm and student oriented in a more general and more effective way than successful high SES teachers, who tended to be more focused on academic interactions and teaching the curriculum.

The percentage of private work contacts over itself plus public response opportunities provides an index of the relative frequencies of interactions with the teacher that occurred privately vs. those that occurred during public discussions or reading groups. This variable showed curvilinear, but mostly negative, relationships in the first year, but the second year data were more mixed and less interpretable, particularly for the low SES students. Thus, at best, these data provide weak support for the idea that frequent public response opportunities in reading groups and in whole class discussions are positively associated with learning gains in high SES classrooms. This variable appears to be essentially unrelated to learning gains in low SES classrooms.

The variable procedural contacts over itself plus response opportunities gives an indication of the relative percentages of interactions with teachers that were devoted to procedural matters vs. those responses to questions devoted to dealing with the curriculum. Negative correlations were expected for this variable, but the findings were sparse and mixed. The low SES data are somewhat positive, suggesting that individualized contacts with the teacher, even when they deal with procedural rather than academic matters, may be more helpful than whole class discussions or other verbal interactions. The data for high SES classrooms did show the expected negative relationships, although they are usually curvilinear and there is at least one exception.

The variable teacher initiated work contacts over teacher initiated work contacts plus teacher initiated procedural contacts indicates the degree to which the teacher focused on curriculum relevant topics in initiating contacts with the children. The expected positive correlations for this variable were observed in low SES, although the relationships tended to be inverted U's rather than linear positive ones, while the relationships in high SES tended to be primarily negative curves. These data are part of the broad pattern suggesting that teacher directiveness in general and teacher initiated inspection and discussion of student work is positively associated with student learning gains in low SES schools but negatively in high SES schools. We interpret this to mean that the low SES children require or at least benefit maximally from this kind of teacher behavior, whereas the students in the high SES schools seem to do better if they are instructed to let the teacher know if and when they need help. Systematic and frequent teacher inspection of student work in high SES schools could amount to needless over-kill and could be generally less successful in producing student learning gains than a system involving promoting student initiation of work contacts when the student feels that he needs help.

Teacher initiated work contacts involving praise correlated generally negatively with student learning gains in the first year. In the second year, the relationships were positive for low SES but still negative for high SES. Here again, praise not only failed to show the expected positive correlations with student learning but even showed some significant negative ones. For low SES students, at least, the second year data suggest that praise in teacher initiated contacts was useful.

The next three variables involve the degree of teacher observation and feedback to students in teacher initiated work contacts (mere observation without feedback vs. brief feedback vs. long feedback). Mere observation without any feedback at all correlated mostly negatively in low SES. Also, all of the significant correlations for high SES were negative, but some of the curvilinear analyses revealed positive curves in year 1. In general, however, the data suggest that teachers who go around the room and watch the children work by looking over their shoulders but do not say anything to the children are relatively unsuccessful.

Provision of brief feedback to the students showed mixed and largely curvilinear relationships. Provision of long feedback also showed mixed relationships, although here there was something of a preponderance of positive relationships in low SES and negative ones in high SES. The inconsistency of the data suggests that these categories are too broad to be interpreted very meaningfully, and appropriateness of these types of feedback would vary with the situation. However, there is some evidence that as a general rule high SES students more often need only brief feedback compared to low SES students who often need more extended feedback, as would be expected.

Data on percentage of teacher initiated interactions involving sharing personal experiences or other purely social matters was not collected the first year. The second year data reveal generally mixed results for both groups. Thus, this variable was not very important as a correlate of student learning gains. High frequencies of teacher initiated social contacts neither motivated students strongly enough to affect their learning gains noticeably, nor cut into the time they spent on academic work noticeably enough to affect learning gains significantly.

Teacher initiated contacts which were management requests showed mixed data for low SES but mostly negative correlations for high SES. The latter data tie in with other evidence that the more successful teachers had worked out some kind of "automatic" method of dealing with everyday management problems, so that they seldom had to make management requests.

The next two variables deal with whether or not the teacher thanks a student when he complies with a request to do a favor or a management task. The data on these two variables are mixed but mostly positive in low SES and mixed but mostly negative in high SES. The low SES data make intuitive sense and fit with the general pattern of warmth and student orientation revealed by these successful teachers in these schools. The negative relationships in high SES were unexpected and remain puzzling. It is possible that the teachers with high scores for thanking students for such requests tended to do it in a way that seemed "phony," that embarrassed the students, or that had some kind of unintended negative effect on the students. It seems unlikely that thanking a student would in itself have a negative effect. However, the thanks usually came after the request was completed by the student. Frequently, the task took some time. Meanwhile, the teacher was usually involved in something else, so thanking often meant breaking from present activity to turn attention to the student. Since management and favor requests were usually made to a student so the teacher didn't have to interrupt her activities with the class, it is likely that failure to thank is related to keeping up the momentum and pacing of class activity more than to "phony" thanks. Thus, our interpretation of these high SES findings is that this variable is associated in some unknown way with more powerful and meaningful negative teacher behaviors. That is, we do not believe that thanking students by itself is bad; we believe that teachers who are high on the variable of thanking students also are teachers who do or do not do certain things that are more directly associated with student learning gains.

The next three variables combine teacher evaluative reactions toward students across different contextual situations. The first variable is academic praise over academic praise plus academic criticism. Relationships are mostly curvilinear in both groups, although, as might have been expected from earlier data, the general drift of the data is positive in low SES and somewhat negative in high SES. Probably the most noteworthy aspect of these data is that the lines and curves for the high SES teachers are not nearly as negative as might have been predicted from some of the earlier data on criticism. This is more evidence that although these teachers were demanding and critical to a degree, they were not hypercritical or negativistic toward the students. In fact, the data on this variable suggest a good balance between praise and criticism of student work.

The next variable deals with behavioral praise, which was infrequent but still allowed several analyses to be completed. Behavioral praise was praise for behavior that the teacher defined as "good," such as cleaning up the desk properly, getting in line promptly or appropriately, etc. The data reveal mixed and very weak relationships in high SES, but consistent and rather strong negative relationships in low SES. Taken at face value, at least, these data contradict notions based on behavior modification ideas. Behavior modifiers would predict a positive relationship between behavioral praise and good classroom behavior which in turn should yield a positive relationship between behavioral praise and student learning gains. However, the opposite was found in the low SES schools. It should be noted, though, that behavioral praise data take into account only frequency of occurrence; the teachers were not coded for whether or not they praised appropriately or contingently. Also, several teachers in low SES noted that public recognition and praise was embarrassing for students, making them feel awkward in front of their peers, so some teachers at least tended to avoid it. Thus, it is possible that the behavioral praise that did appear was given inappropriately, was given to only a few children who were "teacher's pets," etc. In any case, behavioral praise correlated strongly and consistently negatively with student learning gains in low SES schools.

The next variable is behavioral warnings over warnings plus criticism. This variable indicates the tendency for teachers to respond with a relatively mild and nonrejecting warning as opposed to a more intense and rejecting criticism in situations where they felt it necessary to call attention to a student's misbehavior. These data show a sharp contrast between general class data and reading group data. The data for general class reveal positive correlations with student learning gains for both SES groups. In contrast, the reading group data reveal negative relationships for low SES and mixed relationships for high SES. Positive relationships had been expected based upon Kounin's (1970) findings that overreactions by the teachers tended to produce a ripple effect and to compound rather than classroom control problems. Fruthermore, it was expected that teachers who tended to warn students would be generally more successful than teachers who failed to give such warnings and then ended up lashing out at students critically when misbehavior occurred. Thus, the data for whole group interactions in the mornings and afternoons fit expectations, but the reading group data largely contradict expectations. We do not know exactly why the differences occurred, although there was a systematic whole group vs. reading group difference in the nature of teacher behavioral interactions. Teacher behavioral interactions occurring in the whole group situation tended to occur as soon as something happened and when the teacher was paying attention to the class as a whole. In contrast, behavioral interactions that occurred when the teacher was busy with a reading group usually involved children who were not in the reading group. In effect, children elsewhere in the class had become sufficiently disruptive that the teacher had to take time out from the reading group in order to correct the misbehavior going on outside of the reading group. It is probable, although there is no way to tell for sure from the data, that teachers waited for more intense and provocative kinds of disruptive misbehavior before interrupting their reading groups to intervene, and consequently that more of the misbehavior that they had to deal with while busy with a reading group was frustrating enough to them to cause them to react with criticism rather than simple warnings. This may be the major reason for the contextual difference between the data for whole group interactions vs. the data for reading group interactions.

The next five variables deal with aspects of classroom control based upon the work of Kounin (1970). The percentage of disciplinary contacts with students that involved one or more error (target error, timing error, or emotional overreaction) unexpectedly correlated positively with learning gains in low SES, although it showed the expected negative correlation in high SES. This will be explained below. The relative frequency of target errors over total errors was low, so that few analyses could be completed. Those that were done suggested that target errors were slightly positively correlated with learning gains in both groups, but the data were quite sparse. The data on timing errors (allowing a minor problem get out of hand so that it becomes a major disruption) was strongly negatively related to learning gains in low SES schools but showed a mixed pattern of relationships to gains in high SES schools. Finally, overreactions showed a generally positive pattern of relationships to learning gains.

The data for low SES teachers indicate that overreactions were somewhat positively related to learning gains and that timing errors were strongly negatively related to learning gains. Thus, in these classrooms it was particularly important to "nip a problem in the bud" before it spread to other students or became more intensely disruptive. In contrast, the more successful teachers in high SES schools tended to be those who made no errors at all in dealing with student misbehavior, but who tended to err on the side of overreaction when they did err. Thus, these teachers apparently were generally good classroom managers who seldom had to deal with classroom misbehavior, but when they were sufficiently provoked to deal with it, they often overreacted, at least in the eyes of the classroom observers.

The final variable in this set deals with teacher attempts to deal with misbehavior through non-verbal control (moving close to the disruptive student or touching him or getting his attention and making a meaningful facial expression or gesture). This variable showed generally weak and mixed relationships in both social class groups, although there was some tendency toward negative patterns for reading group contacts in the high SES schools. In any case, there was little support for this as a discipline method, despite its frequent recommendation by behavior modifiers. The fact that the most consistent negative relationships were obtained for reading groups is especially surprising, in that it is most easy to use non-verbal communication as control mechanism in small group sitations where the children are close enough to be tapped or otherwise contacted non-verbally.

The next three variables combine teacher feedback data in responding to student answers or in giving feedback during private contacts. Across all response opportunities, repeating the question divided by repeating plus rephrasing or giving a clue plus asking a new question, showed a general pattern of negative correlations in low SES (with one notable exception) and mixed data for high SES. These data for the combination of response opportunities are less enlightening than some of the earlier data on these variables that broke them down more specifically. The general principle that appears to underline the findings is the one mentioned earlier that low SES students benefit to some degree from attempts to rephrase the question or give a clue, and that neither group of students, but particularly not the high SES students, benefit from simple repetition of the question without any form of help.

The next variable indicates the relationship of giving help to alternatives which do not involve providing help. This again shows a primarily positive although somewhat curvilinear set of relationships for low SES, and a curvilinear but more mixed set of relationships for high SES.

Finally, brief feedback over brief plus long feedback also shows mixed findings but a trend toward negative relationships in low SES and a positive one in high SES. As pointed out earlier, high SES students generally need less extended teacher help than low SES students in completing their seatwork.

The next set of data deal with mathematics contacts. Consequently, data appear in the tables only for morning and afternoon interactions, and not for reading groups (which did not involve math contacts by definition). There was not enough information the first year on these variables to allow meaningful analyses. The second year data showed that the proportions of math contacts which were public rather than private was positively associated with student learning gains in the high SES schools and unrelated to student learning gains in the low SES schools. This indicates again that high SES students were capable of learning in larger groups and did not seem to require the personal supervision and attention of the teacher that the low SES student needed. Similarly, teacher initiated private math contacts over total math contacts correlated negatively with gains in high SES schools consistently, but had mild positive relationships in low SES schools. This again indicates that the low SES students needed teacher structuring but that the high SES students learned best when taught in groups and then left to their own initiative if they needed help. Teachers who spent a lot of time initiating contacts with the students for purposes of inspecting their work were less effective in high SES schools than teachers who presented the lesson and then had the students come to them for help if they needed it.

The data on total teacher initiated math contacts over total math time showed positive relationships with student learning in language arts in the high SES schools but no significant relationships with math, which was the learning criterion of interest.

Total mathematics response opportunities over total math time correlated positively with learning gains in the high SES schools, indicating again that high SES students could learn and apparently learn most efficiently from verbal presentations and group settings, in contrast to the low SES students who appeared to learn better from more individualized and non-verbal practice.

The last variable on the table, total teacher initiated contacts over total teaching time, is an indication of the frequency with which teachers initiated contacts with individual students. This variable showed mixed relationships for both groups, although the data for low SES were stronger and fit with the general pattern noted previously to the effect that teacher initiated contacts were beneficial in these schools.

Teacher Questionnaire

The questionnaire was administered to all 28 teachers participating in the study in year 2, plus two teachers from year 1 who could not be observed in year 2 but who wanted to be included. Thus, thirty teachers completed the questionnaire and interview. The questionnaire contained items consisting of checklists, scales, and percentage estimates, to which the teachers responded by checking, circling, or filling in a number. The items dealt with such topics as proportion of time spent in lecturing vs. class discussion vs. individual seatwork; amount of time spent in lesson preparation; proportion of objective vs. subjective impressions used in grading students; types of motivating devices used; and factors felt to be essential or unessential to good teaching. The questionnaire also included scales on which teachers could rate their teaching concerns, sources of teaching satisfaction, and beliefs about good teaching.

Once the questionnaires were scored, the number of items was reduced to a more managable form for purposes of interpretation. Since standard factor analytic methods were inappropriate in this case because the number of variables exceeded the number of subjects, the questionnaire was broken down into smaller units which appeared to be logically related on a common sense basis. Smaller parts of the questionnaire were analyzed, such as the sections on teacher concerns, the teacher opinion inventory, and the section on satisfactions in teaching. Variables which showed good factor structure and high factor loadings in these analyses were combined into sum scores, after adjusting the various items to make them uniform. For example, the new item "motivating by use of public rewards" was made up of such items as "high use of public recognition," "exemption from tests," "high use of competition and contests," and "giving individual prizes and rewards."

Where ND appears in the table, frequently curvilinear analyses could not be performed because variance on the item was too low. In many of these cases subjects were nearly unanimous in agreeing or disagreeing with the item. A (agree) or D (disagree) are typed to the far right of the table to indicate the direction of unanimity on the item.

Questionnaire Variables

Data from the questionnaire variables appear on Table 9. The first 214 variables on the table are individual items that did not cluster together on factors; the remaining items are combination scores reflecting two or more items which were added together after factor analyses revealed high intercorrelations and good factor structure.

The first variable, high percentage of objective grading, showed a single positive correlation with learning gains in low SES schools.

Teachers reported that frequent discipline problems, in their view, were due to lack of interest in subject matter. This produced generally negative correlations in both groups including one significant one in low SES. These negative relationships were expected; they probably reflect teachers' inability to match their subject matter instruction to their students' needs.

The teacher's staying at her desk a high percentage of the time (as reported by the teachers) showed weak and mixed relationships for low SES, but generally negative correlations for high SES. The latter relationships had been expected for both groups.

The use of a high percentage of lectures and demonstrations showed only generally negative curves for arithmetic reasoning for both groups. Once again, the lecture-discussion dimension was found to be relatively unimportant at these grade levels. Using a high percentage of questions with only one correct answer produced two negative correlations, again in arithmetic reasoning, and two small curves for both groups. These two variables, high percentage of lectures and demonstrations and high percentage of questions with one correct answer, would seem to be appropriate methods for teaching math, at least in low SES schools. However, the negative relationships were confirmed to arithmetic reasoning and were stronger in high SES schools.

A high errorless performance required for general class discussion showed generally negative relationships and two inverted U-shaped relationships, indicating an optimal error rate, as found in the process data from the study. Likewise, a high ideal errorless rate in reading groups showed negative relationships for high SES and mixed relationships for low SES. This again fits with other findings indicating that an error rate which is too low is ineffective for high SES children, who benefit more from harder questions and more challenge.

Teachers reporting a high use of the context or whole word approach in teaching reading tended to be less effective in high SES classrooms. However, the relationship was with arithmetic computation gains, and thus is of questionable meaning. Silent reading in reading groups showed one significantly negative correlation with word knowledge gains for low SES teachers. Apparently, low SES children need practice in reading aloud before they are able to read silently very effectively.

Teachers reporting a high percentage of individual reading in reading groups for high SES showed an optimal level of individual reading; the inverted U-shaped curves for low SES were uninterpretable.

The practice of allowing students to call out comments showed no data at all in high SES and one weakly positive relationship in low SES.

The reported assignment of a large amount of seatwork showed a single strongly positive correlation for low SES schools. This may be related to a larger cluster of variables indicating that practice and drill at these grade levels is an effective teaching method for low SES children, because it allows for repetition of skills they need to practice. Assignment of large amounts of homework, however, showed mostly negative relationships for low SES and no data for high SES, as expected.

No important relationships show up again until variable #38. Teacher reporting a high frequency of severe disruptions in their classes tend to show postitive relationships in both groups, but with only one significant one for high SES. This is surprising, since most of our data indicate that effective classroom management tends to inhibit disruptions from breaking out at all and that good classroom control was associated positively with learning. Perhaps teachers who report this as a problem actually exert tighter control in their classes than teachers who are less concerned about disruptions.

Teachers reporting that they publicly praise a child frequently as motivation to others tended to be effective in both SES groups. This is at some variance with the data from our high and low inference measures, which show that very little praise actually occurs, and that the results of this praise tend to be mixed and generally weak. In any case, the relatively successful teachers believed that they used public praise more often than other teachers, even though observations showed that they did not.

Giving a high number of different assignments on any given day showed one weak inverted-U curve for low SES and one slightly negative sloping curve for high SES, which are better left uninterpreted.

Effective low SES teachers reported that they frequently had students react to other students' answers. This is possibly related to patterns in other data indicating that it is especially important to get responses from students in low SES, and it probably also helped keep students attentive.

The regular use of praise as a motivational technique showed no data in high SES. This lack of data for high SES is actually a lack of variance, since almost all high SES teachers reported that they used praise to a great extent. Almost no teachers in high SES indicated that they praised any less than "frequently". Relationships were mixed for low SES, however, showing one positive and one negative relationship. Again, teachers in general believed that they praised much more often than they actually did.

The reported use of smiling faces and gold stars as rewards revealed generally negative relationships in both groups. This was especially strong in high SES, where there were several significant curvilinear relationships which were mixed but generally negative. These teacher perceptions also conflict with process observations, which indicated that the more successful teachers used symbolic rewards more often (i.e., the relationships were positive).

Granting of special privileges showed generally shallow U-shaped curves in both groups. These curves tended to be more in the negative direction for low SES, but slightly positive for high SES. In general, teacher perceptions of their praise and reward behavior were inaccurate (contrasting with generally accurate perceptions in most other areas).

The belief that initiating, direction, and administering were necessary to good teaching tended to correlate negatively in high SES and positively in low SES, although only a single weak relationship showed up for each group. This is additional evidence to the effect that teacher direction is important for low SES children, but less so for high SES children.

The belief that unifying the group was important to good teaching showed two uninterpretable U-shaped curves for both groups. The belief that diagnosing learning problems is necessary to good teaching revealed no data for low SES (because all teachers rated this as extremely important), and essentially positive relationships in high SES, as expected.

Making curriculum materials showed generally positive relationships across the board, as expected, for high SES, although the curves peaked at optimal levels. For low SES, the curves tend to be mixed and somewhat conflicting. The SES differences could have resulted from differential teacher perceptions of the item. Perhaps low SES teachers read this question as making *remedial* material where necessary, while high SES teachers read it as making *enrichment* materials. In any case, here again the teacher perception data do not fit observed behavior: coder ratings suggested that use of homemade materials was positively related to learning in low SES but negatively in high SES.

The belief in exposing children to enriching community activities was strongly negatively correlated in low SES but showed no relationships at all in high SES. At this point, this is a difficult finding to interpret. There is no reason to suspect that exposing low SES children to enriching community activities would be "bad" or ineffective. One possibility is that teachers of low SES children do not see this as a high priority item compared to diagnosing learning problems or other variables more immediately related to classroom learning.

There were two generally positive relationships for the importance of participating in school activities for each group, while participating in professional and civic life revealed one negative relationship for low SES and one positive relationship in high SES. Thus, neither of these variables was strongly related to learning.

Involving students in ugly or distressful aspects of subjects showed a single negative relationship for low SES schools, and no other relationships. Apparently, effective low SES teachers did not feel that this was important or desirable for their students.

Quickly informing students of the correctness of their answers showed negative relationships to word knowledge gains in both groups. These curves contradict the idea that feedback must be immediate to be effective, although the relationship was significant for only one criterion test.

Encouraging the tackling of hard problems showed two inverted U-shaped relationships for high SES and two positive correlations as well, indicating that there is an optimal level in the tackling of hard problems and an optimal level of difficulty involved. This fits in well with the optimal error rate findings reported earlier. Up to a certain point, difficult problems are challenging for high SES students and tend to maximize gains. The relationships in low SES were relatively weak and mixed, however.

Stress on giving exact instructions on each task showed two generally negative relationships in high SES. This could be interpreted as overdwelling to the point of boredom, a practice which other data has shown to be rather ineffective for high SES students. The relationships in low SES are rather shallow and difficult to interpret.

Engaging students in drama and music showed generally negative but weak relationships for both groups, suggesting that, while important, these did not rank as high as some of the other activities believed necessary for good teaching. Also, these teachers' gains were in subject matter areas, so that proficiency in music and drama was not expected to be important.

High use of peer tutoring showed no data for high SES and one rather weak negative relationship in low SES. The latter finding is the same as the one noted in the observations, suggesting that low SES children do not benefit much from peer tutoring in these early grades when they are still more dependent on the teacher.

Frequent praise showed strong negative relationships in low SES and weak and mixed relationships in high SES. This is one of several findings for praise which are mutually conflicting. In some instances, no data appear because all teachers reported that they believed praise to be extremely important. In other cases, relationships simply failed to show up. In this case, there are strong negative relationships. As we have stated before, even though teachers may report that praise is extremely important, their reports do not coincide with the behavioral data and with other data from the study showing that praise, overall, tends to occur relatively infrequently.

We suspect that this may be one of the several variables on which teachers say one thing and do another. A possibility for the strong negative findings for praise is that there is a tendency, at least in low SES, for children to be embarrassed by public praise. Many low SES teachers mentioned that they tried to avoid publicly embarrassing a child by praising him in front of his peers, thereby setting him up for possible peer rejection. However, private praise from the teacher tends to be seen as facilitating and encouraging.

Belief in preparing students for the Metropolitan and Stanford Achievement Tests tended to be negatively related to gains. This was surprising, since these teachers were selected on the basis of their performance in producing student gains on these tests. Ironically, teachers least concerned about test performance were most successful in producing it, and vice versa.

Two shallow and rather uninterpretable curves appear for arranging attractive bulletin boards, one for low and one for high SES. Thus, data on bulletin boards proved unimportant, despite the stress sometimes placed on this aspect of teaching.

Becoming involved in out-of-school problems tended to show generally positive relationships in high SES and U-shaped relationships in low SES, making it difficult to interpret findings for the latter. The data for high SES teachers fit data for "participating in professional and civic life," which also was positively related to learning in high SES.

High effective high SES teachers reported that working with books and ideas is a source of high satisfaction for them. No data, however, appeared for low SES teachers. Given that these teachers were selected on the basis of their success in producing cognitive gains in children, it is not surprising that reported satisfactions in working with books and ideas was correlated with teaching success.

Satisfaction from non-teaching duties showed mixed relationships which are difficult to interpret.

For the set of variables involving general practices in presenting seat work, stress on presentation of new material showed one negative correlation for SES. There were U-shaped curves in each group for summarizing new material, and weak negative correlations for both groups for practicing new material. Negative relationships appeared in low SES for giving directions for follow-up seatwork. There were positive but weak relationships for high SES for this variable. In general, the teacher self-report for this group of of seatwork presentation variables showed no consistent positive relationships with learning gains, only negative relationships which are difficult to interpret appeared.

Having the entire class line up often was negatively correlated in both groups, as expected. This is probably an indicator of poor classroom management, involving over-emphasis on lining up and perhaps also wasting time with unnecessarily long transitions.

An inverted U-shaped relationship appeared for each SES group for using the success or failure of assigned work as the most important basis for assigning grades. There was a single negative relationship in low SES for the acknowledgment of effort in assigning grades. It appears that level of success determines the grades students will get, although the relationship is curvilinear rather than absolute.

Teachers in high SES schools reported that their own teacher-made tests were less effective in determining or making decisions about students. No other data appear for this group of variables. This supports some other information in our data indicating that standardized achievement tests or curriculum based tests tend to work well with high SES children but not necessarily with low SES children.

There were generally negative and weak relationships for the use of learning centers without audio-visual aids. Teachers in both groups tended not to report this as a frequently used teacher resource.

The next variables deal with things reported as serious problems. A wide range of student achievement showed one positive correlation in low SES classrooms but no data for high SES (because all teachers in these schools did not see this as a problem). The nature and quality of instructional materials showed a single negative curve for low SES. The relationship was exactly the opposite, however, in high SES. The nature and quality of instructional materials was often mentioned by low SES teachers as a serious concern, chiefly because they saw a need for materials specifically designed for children in low SES classrooms. In any case, low SES teachers who were dissatisfied with materials were more successful, but dissatisfied high SES teachers were less successful.

Effective low SES teachers also reported that they would like more help from clerical and secretarial staff. This is of major concern in low income schools which are frequently short-handed. In high SES schools, however, teachers who voiced this complaint were less successful than average.

More time to develop new programs showed a single negative correlation for low SES, which is not readily explainable. Also, more time to plan daily activities showed generally negative correlations for low SES, though some positive correlations for high SES. High SES teachers also report that they would like more time to relax and think. There were several positive correlations for this variable. No data appeared for low SES teachers, since all of them saw this as a serious need.

The next set of relationships concerns beliefs, attitudes, and opinions about teaching and its methods and goals. There were negative correlations for avoiding competition in front of the whole class. Successful low SES teachers believed that some forms of whole class competition were beneficial.

Effective high SES teachers believed that good teachers admitted their ignorance openly. Several positive correlations appeared for this variable in high SES. No data appear in low SES because all teachers agree. In high SES, this was one of the strongest and most general correlates of student learning.

Both groups of effective teachers tended to agree that it was not good to enter grades in a grade book while children recited in front of the class, as expected.

Low SES teachers reported that math was as easy to learn as any other subject. This is one of several variables showing the importance of positive expectations (the belief that the teacher can and will succeed in meeting her goals).

Generally negative relationships across the board appeared for having children repeat poor work as punishment. Successful teachers do not see this as an effective punishment, believing that it would only serve to turn students off.

Two weak negative relationships, also appeared in both groups for gearing teaching to city-wide tests. Although there were no city-wide tests as such, nationally normed achievement tests, tests based on the textbooks, or specially prepared tests produced by the teachers themselves were used. Again, the teachers least concerned about test scores tended to be the most successful.

Effective teachers in low SES tended to discount the idea that the teacher's personality is more important than her teaching methods. However, this was not true for high SES teachers, where there were generally positive relationships. Perhaps low SES teachers spent a great deal of time in practicing, remediation, and in getting across skills to their students, so that teacher personality was less of a factor for them than their ability to engage their students in practice of needed material.

Strong positive relationships appeared in high SES on all subtests for the belief that effective teaching requires the teacher to know the backgrounds of her students. The relationships for low SES were positive but weak. The strong and impressive results for high SES were expected, but not the weak ones in low SES, since the practice of knowing students' backgrounds should be effective for low SES teachers as well.

The belief that without proper training mental abilities remain undeveloped showed shallow inverted U-shaped curves for two of the math subtests, suggesting that to some extent training is important but too little or too much to the point of overdwelling and boredom is detrimental. It is appropriate that these relationships should show up in the math subtests rather than in the others, since math involves more drill and memorization.

The reported belief that the teacher's main job is intellectual training for students showed two conflicting curves for low SES and two inverted U-shpaed curves for high SES. Thus suggests that, at least in high SES, there is an optimal level of intellectual training that is desirable for students.

Effective high SES teachers tended to agree that some students ask too many questions. The relationships for low SES, however, were shallow and mixed. It is likely that high SES teachers encounter more frequent student questions, since students in high SES classrooms are likely to be less shy, to show a greater amount of eagerness to respond, and to how competitiveness in gaining the teacher's attention.

No readily interpretable data appear for the belief in the importance of small group discussions. This bears out other data suggesting that this technique is of little importance in the early grades.

High SES teachers do not agree that problem solving is one of the main purposes of school. This is a rather surprising finding considering the emphasis on academic achievement at this level. Perhaps the negative relationships reflect an affective interest, although they may reflect belief in

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the importance of teaching basic tool skills in the early grades and saving problem-solving for later.

Effective high SES teachers agreed that it is natural and healthy for children to resist the teacher. There were strongly positive relationships across several of the subtest groups for high SES. It is likely that "resisting the teacher" was not seen as a behavioral problem so much as an assertion of independence. The relationships for low SES show no particular pattern (serious behavioral resistance was probably more common here).

The statement that the teacher should talk to the child as she would to an adult revealed one significant negative relationship in low SES and one significant positive relationship in high SES, again showing different beliefs for these two groups. It is possible that this attitude is reinforced by the facts that talking to high SES children as adults is likely to pay off and that verbal control is effective. Other high inference data indicated that a simple, calm discussion of the incident tends to be an effective method of control with high SES children, but not for low SES.

There is general agreement among effective teachers in both SES groups that a good teacher lets the kids do the work rather than doing it for them or allowing them to copy from other children. These relationships are especially consistent in high SES.

Effective high SES teachers tend not to agree with the notion that the only important thing to teach is a principle. One negative relationship appears for this variable, along with one generally negative sloping curve. This fits with other interview items indicating that high SES teachers prefer teaching facts over global concepts. We interpret this as an expression of the teacher's concerns that children recently have not been taught facts sufficiently, and that there has been an over-emphasis on process, as in the "new math". High SES teachers have expressed concern that while children understand process they have not had enough practice in rote memorization of those skills which must be learned by rote, e.g. multiplication tables.

A single negative correlation appeared for low SES teachers for the statement that explanations should be short in order to retain interest. This again indicates that successful teachers, especially in low SES, had high expectations.

The belief that peer tutoring is good teaching technique is not supported in low SES. This is replicated in other data suggesting low SES children are more dependent on the teacher and have not yet gained the skills needed to benefit maximally from peer tutoring.

One negative relationship and one inverted U-shaped curve appeared, for high SES only, for the practice of assigning material and then insuring that the students get to work.

The rated importance of acquiring knowledge basic to a satisfying family life showed general negative correlations in both groups, but these correlations were stronger for high SES teachers. We suspect that these negative relationships are related to the fact that these teachers were selected on the basis of their ability to produce cognitive gains in their children and, consequently, that the more successful ones should emphasize mastery of skills necessary to cognitive development (even though they deemphasized the importance of test scores as such).

No data appeared in low SES for the importance of using advance organizers because these teachers all agreed with this item. One uninterpretable curve appeared for high SES. This variable proved unimportant in process data also, as noted earlier.

High effective low SES teachers reported that they believed that teachers should ask frequently if students understand. It is possible that this variable is related to pacing; it may be one method which low SES teachers use to guage the level of their students and the best pacing of their lessons.

Conflicting relationships appear for the belief that a teacher should discourage students from moving around the room freely.

Low SES teachers tended to not agree that directive teaching produces a more passive student. This is an additional, though small, piece of evidence in support of the affectiveness of teacher controlled learning for low SES children.

One surprising set of negative findings appeared, for high SES teachers only, concerning encouraging children to believe that they can succeed. There are no data for low SES, because teachers were unanimous in agreeing with this statement. We do not know why this item correlated negatively for high SES; most other data regarding expectations showed positive relationships with learning. Perhaps the successful high SES teachers interpreted this item to imply unrealistic encouragement (urging children to strive for goals which they are unable to meet).

High SES teachers reported that they often ignore students who continually raise their hands. We suspect that this is a healthy strategy, at least at this level, because overly eager and competitive students, if they condition the teacher to call on them too often, may prevent her from calling on other, less eager students. We suspect that this is a deliberate attempt on the part of these teachers to be certain that each student gets a chance.

The belief that effective learning comes from a logically organized text showed a single negative relationship for low SES. Low SES successful teachers felt that a logically organized text may not be the best vehicle for transferring information or for getting a skill across to children. Other data suggest that curriculum materials may be more appropriate for high SES students than for low SES students.

There were two positive relationships, one in high SES and one in low SES, for the belief that teachers should be wrong sometimes. This is probably a method of challenging students and keeping their attention.

The belief that the teacher's primary job is explaining subject matter showed only one positive correlation in low SES. In high SES, there were a series of U-shaped curves suggesting an interaction between this variable and one or more others.

Reminding children to ask when they don't understand had no data for low SES and negative relationships in high SES. Perhaps the majority of children in high SES schools are less timid and do not need to be reminded to ask when they don't understand. In any case, these teachers felt that it was not important to emphasize this with them.

The belief that there are no specific rules for effective teaching showed one negative correlation for low SES. This suggests that low SES teachers are very aware of specific strategies used to teach their students.

The belief that routine can adversely affect learning was negative in high SES and produced no data for low SES. Most low SES teachers disagreed with this item. This is one of a series of variables which suggest that more challenging, stimulating, and less routinized organization of the classroom works well for teaching high SES pupils. No data appeared for high SES for the belief that teaching should be evaluated independently of learning results. Two negative correlations appeared for low SES classrooms. This relationship

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is not surprising in view of the fact that these teachers were selected on the basis of their consistency in producing learning gains. Consequently, they would be expected to be concerned about learning results and to tie their teaching methods to strategies which produce these results.

The belief that without practical usefulness, knowledge is without value showed an expected negative correlation (for low SES) and two weak curves. Negative relationships were expected on the basis that successful teachers would value knowledge for its own sake.

One single negative correlation appeared for high SES for the belief that teaching techniques must be adapted to individual students. Perhaps successful high SES teachers believe that their children can benefit from group instruction and that individualization is not crucial.

The teachers' opinion that in most classes students should be ability grouped produced no data for high SES classes, since all high SES teachers agreed with the idea of grouping. A few weak negative, correlations appeared for low SES classes.

The next variable showing interpretable data is the belief that a good teacher never uses compulsion. This produced strong negative correlations across the board in low SES, and weaker negative correlations in high SES. Apparently, effective teachers have found ways to get their students to perform without resorting to compulsion.

The belief that it is unnecessary to know individual students well showed positively rising curves in high SES but no data for low SES. Lack of variance for low SES was due to the fact that almost all of these teachers disagreed with the statement. The data for high SES teachers agree with an earlier item in suggesting, contrary to expectations, that the more successful teachers were not concerned about individualization.

The opinion that objective exams are not good because they produce no original ideas showed positive relationships for high SES and weak, but negative, relationships in low SES. This was somewhat expected, because, as with previous variables, more challenge, more stimulating teaching, and more emphasis on creativity, tends to be positively related to learning, in the high SES classrooms. The negative relationships for low SES suggest that many objective exams are testing product-type knowledge, and low SES children are better able to respond to this type of examination question than they are to the more complex process-type questions.

The belief that students should repeat grammar construction until correct produced no data in low SES and one uninterpretable curve in high SES. The curve suggests a slightly negative relationship for this variable.

Effective teachers in both groups tended to report that it was important to make definite rules about good teaching. This is confusing, because those teachers also stated that they saw teaching as an art rather than a science (item 192).

The reported belief that teachers should be expected to spend some free time with students if it would help them learn produced no data for low SES because all teachers agreed with the item, but there were several inverted U-shaped curves in high SES. These suggest a belief that a certain amount of teacher time is beneficial, but that too much is counter-productive and can produce student dependency.

The belief that it is unrealistic that students can get along without teachers showed negative correlations in high SES, fitting in with the pattern previously seen, that high SES children can work more independently and work alone longer without help from the teacher. We suspect that this is less true for low SES students, however.

The belief that one should not do a lot of oral evaluating of a student's work showed negative relationships in low SES, suggesting that oral evaluation of student's work is viewed as a method for introducing redundancy and feedback into daily lessons so that children may get a better idea of correct or appropriate answers. There were no data for high SES because all teachers disagreed with the statement.

The next variable for which data appear is the belief that teaching is an art, not a science. Effective high SES teachers agreed with this statement, though no data appear for low SES because the entire group of teachers agreed with the item.

Conflicting data appear for the belief that if instruction is clear, few discipline problems occur. Generally, no relationships showed up in low SES. There were two inverted U-shaped curves for high SES suggesting that clear instructions are valuable to a point but that after that more explaining could amount to over-dwelling, hence boredom and more discipline problems.

Effective high SES teachers generally agreed that non-achievers should be failed, while no data appeared for low SES for this variable since all low SES teachers disagreed that these students should be failed. Low SES teachers tended to disagree with the statement that lecture is seldom desirable. This relates to other data suggesting that explaining and practice are important at this grade level for these children.

Competition in bees is believed desirable by effective high SES teachers, but it relates negatively in low SES. This supports earlier data suggesting that competition, stimulation, motivation, and independent activity are seen as more important for high SES children than for low SES children.

The next set of variables are those on which teachers rated their degree of concern. The nature and quality of instructional materials was not a great concern in either group. Negative correlations appeared for this variable in both groups. However, frustration with routine and inflexibility of the classroom situation was positively related to learning in high SES. This fits with the previous data suggesting that routine can adversely affect learning. This is more support for the notion that high SES students can accommodate to changes in schedule and routine without a great deal of upset, can work independently, and frequently require challenge and stimulation.

Becoming too personally involved with students showed a generally negative trend in low SES, suggesting that this is not a concern for these teachers, and a shallow inverted U-shaped curve in high SES. Diagnosing student learning problems did not appear to be a concern in either group. Although too many non-instructional duties were of concern to effective low SES teachers, this relationship did not hold for high SES.

Insuring that students grasp subject matter fundamentals showed two curves, one in each group. The curve for high SES is generally negative in slope.

Working with too many students each day showed a single negative relationship in each group. This apparently was not a major concern for effective teachers. Concern about understanding the philosophy of the school was generally negatively related in high SES, with mixed findings for low SES. Concern about students who disrupt class showed an inverted U-shaped curve for low SES and a shallow U-shaped curve for high SES. Concern about student use of drugs was strongly negatively related in both groups. This is much less of a concern at these early grades than it might be at higher grade levels.

Effective low SES teachers indicated concern about whether each student was getting what he needed. This variable produced several positively rising curves, as was expected. In high SES, on the other hand, inverted U-shaped curves indicated that concern about making sure that each student got what he needed was facilitative only up to a point.

Concern about the emotional and social needs of students was minimal, showing only one negative relationship for high effective low SES teachers.

The next set of variables, beginning with #215, are those which clustered together on factors. Item scores were collapsed to produce 62 combined scores.

The first of these items is the practice of using public rewards such as peer approval, symbols, or stars. Positive relationships were found for high SES and also for low SES, though none of the latter were significant. This bears out the data from observer ratings of teacher behavior.

Emphasis on good classroom control showed inverted U-shaped relationships for high SES, indicating that there is an optimal level of classroom control. Little control yields low gains due to chaos, while too much control may lead to a restrictive repressive classroom climate which is detrimental to academic achievement. The patterns for low SES are conflicting and less easy to interpret, however.

The belief in the importance of individualizing student learning showed two shallow curves, one for each group. These relationships are best be left uninterpreted.

Belief in the importance of organizing and motivating was generally negatively related in low SES, and no particular patterns emerged for high SES. It is possible that organizing and motivating were not of high concern to these teachers because they were not a problem. They may do their things routinely.

Belief in the importance of affective aspects of teaching showed no particular patterns. Only a single negative correlation for low SES emerged for teachers' gaining satisfaction from working with people.

High effective high SES teachers reported satisfaction from dedicating themselves to difficult teaching problems. This is supportive of other evidence showing that there is a certain determination in these teachers to get across subject matter and to produce gains in students.

Effective low SES teachers did not agree with the statement that exams were good devices to help teachers evaluate student learning. This fits with some other evidence to the effect that exams, in general, lack validity for many low SES students. Some children at this level lack test taking skills, ability to follow directions, or ability to put down on pencil and paper tests what they know. However, low SES teachers tended to rate highly the importance of IQ in teaching and evaluating students. This is somewhat contradictory with other evidence, since they appear to reject the evidence of achievement exams, but to accept the evidence of IQ scores in evaluating students. High SES teachers tended to report that tests should be used to improve teaching, not to evaluate students. There were slight negative relationships for low SES teachers, though none of these were significant. Getting along with children and with school personnel revealed only a weak negative correlation in each group. Thus, this is not a problem for these teachers.

Concern with guiding students and providing a stable emotional and intellectual climate showed weak positive relationships in high SES and a single weak, shallow curve in low SES.

Surprisingly, low SES teachers were not concerned with physical limitations in time and materials. Likewise, effective teachers were not concerned about being favorably evaluated for doing a good job. We suspect that this is because these teachers were more concerned with producing gains in teaching their children than they were about evaluations of themselves.

Classes centering around student input showed strong negative relationships in high SES. Apparently, while students tend to take a more active part in these classes, the teacher must remain in control. Relationships here were more mixed for low SES, although they suggest that high effective low SES teachers did not feel that lessons should be flexible and open to student input.

High effective high SES teachers felt that it was not important to summarize and review lessons. Again, overdwelling is not necessary or effective in high SES classrooms. However, teaching facts rather than global concepts was correlated positively in high SES but negatively in low SES, a reversal of what we had been led to expect. We believe this reflects changing attitudes on the part of the teachers in each of these SES groups. Many high SES teachers reported that too many abstract concepts were being taught to children and not enough facts and drill were being given them. They cited as an example the new math. Children were familiar with the process of finding the right sums, and yet were unable to recite quickly multiplication tables or addition and subtraction facts. In low SES, teachers indicated that they tried to put the facts that they were teaching their children into some relevant and more meaningful context in order to increase motivation to learn.

Both low and high SES high effective teachers tended to prefer lecture or explanation to multi-media presentations, i.e. the use of audio-visual aids, etc. Relationships were consistently positive for high SES but somewhat mixed and not quite so strong for low SES.

Low SES effective teachers also preferred to involve parents directly in the classroom. Relationships were negative but weak for high SES on this variable. Parental involvement for low SES classes probably is less frequent and no doubt extremely important.

The use of visitors from the community showed two rather weak relationships, which are best left uninterpreted. Effective high SES teachers agreed that elaborate planning and preparation were not necessary, but relationships were mixed and weak for low SES.

Effective high SES teachers did not agree that pressure to achieve and emphasis on academic mastery was beneficial. This somewhat contradicts other evidence that effective high SES teachers were more demanding, emphasized academic skills, etc. However, at the level of self report, these teachers did not feel that pressure to achieve was beneficial to their children, even though other evidence suggests that they actually do push for gain.

High SES effective teachers reported that lessons should not be flexible. This fits with other data showing that these teachers tended to stick to the curriculum. The low SES data were somewhat less interpretable, with mixed and shallow curves, generally. High SES effective teachers did not agree that learning was easy for most but not all students. This coincides with other data that these teachers dedicate themselves to difficult teaching problems. They are aware that learning is not easy, but nevertheless there is an emphasis on academic success.

Effective low SES teachers tended to reject the idea that students could work on their own and establish their own individual level. Again, this is more evidence that these children are more dependent on the teacher for structuring and sequencing.

There was a single positive correlation for low SES on emphasis on discipline and academic work, as expected.

High SES effective teachers generally agreed that teachers should make lessons interesting. Other data also support the picture that challenge, interest, and stimulation are important in high SES.

The belief that learning is more important than attitudes and happiness of students showed conflicting results, making this variable difficult to interpret.

The belief that success is measured by classwork efforts and teachers' success in teaching slower children showed shallow inverted U-shaped curves across the board for high SES, and uninterpretable, generally flat curves in low SES. These relationships suggest that in high SES success can be measured in this way to a point, but that using these two indicators exclusively may lead teachers to overlook other important determiners of success.

High effective high SES teachers tend to reject the idea that they measure success through childrens' apparent understanding, i.e., that they feel they have gotten across a concept or a lesson because the children appear to understand. This suggests that these teachers remain skeptical about how well pupils have grasped the material until they have checked seatwork or some type of written work or assignment. Students simply appearing to understand because they don't ask questions or look puzzled is not sufficient evidence for the high SES teachers to believe that they have gotten across their point.

Effective low SES teachers feel that drill and excessive problem solving is beneficial in teaching math well, although these relationships appear in the word knowledge and word discrimination subtests. Still, teachers were chosen for their general consistency in producing fairly even gains across all five of the subtests, so it is reasonable to suggest that heavy use of drill is an effective method for low SES teachers.

The idea that teaching should be teacher-centered and well structured showed uninterpretable U-shaped curves in both groups, suggesting that this variable interacts with one or more others.

Belief that subject matter is more important than social and emotional factors showed consistent inverted U-shaped curves in both groups across the board, indicating that subject matter is important to a point, but after that point it no longer is more important than social-emotional factors. Several other variables throughout the study have suggested that subject matter is emphasized by these high effective teachers, but that they do not stress subject matter exclusively to the neglect of social and emotional factors.

Effective low SES teachers rejected the idea that it is important to integrate subject matter for teaching a large class. It is possible that low SES teachers individualize more and, therefore, do not feel the necessity to integrate subject matter for the entire class.

A preference for and orientation to high achievers was positively related for high SES effective teachers, which generally fits with other data suggesting that these teachers did push mastery and challenge their students.

The belief that instruction time is reduced because of control problems and too few personnel in the school showed two generally uninterpretable curves, one in low and one in high SES. The feeling that problems stem from children themselves and their environment was generally positive for high SES, contrary to expectations, but relationships tended to be negative or mixed for low SES. The high SES data here contradict the more general set of findings to the effect that effective teachers assume personal responsibility for student learning. A single positive correlation for high SES appeared for the use of student conduct and personal qualities in assigning academic grades.

Teacher Interview Variables

The next set of variables are curvilinear relationships, shown in Table 10, between the teacher interview variables and student gain scores. Only those items which combined into larger variables or which loaded on factors will be discussed here. Items which did not load on factors were two-point variables (scored 1-0), on which curvilinear analyses could not be run. The variables shown in Table 10 have more than two points and could be curvilinearly analyzed.

Each teacher was interviewed privately by one of the authors or by one or two experienced staff members. The items included in the interview mainly required information difficult to obtain by checklists or scales and usually required lengthy responses from the teachers. The interviews generally began with a broad question such as "How do you provide for individual differences among students?" then narrowed down to more specifically "What do you especially do for high achievers? Low achievers?" Some teachers contributed their own questions for the interview at our invitation, and these were included.

Teachers' placing restrictions on parental involvement showed generally shallow inverted U-shaped curves for low SES, indicating that there might be an optimal level of restriction on parental involvement. The curves for high SES, however, were mixed and less interpretable.

Low SES teachers named disadvantages of busing in terms of childrens' emotional harm. We suspect that this is because they are in a better position to understand the possible emotional harm which can come to children through busing, and because only low SES children presently are bused in this school district (not until sixth grade, however).

High effective low SES teachers did not see black students' needs as instructional, but as social and emotional. This bears out the findings of St. John (1971). The reverse was true for effective high SES teachers. They tended to see black students coming into the school as needing remediation and help and as being behind their white peers in cognitive skills.

Individual reading about education was negatively correlated for high SES teachers, but somewhat positively for low SES teachers. We could interpret this to mean that low SES teachers are continually searching for new and improved methods for remediating and improving instruction for their children, and that the standard materials and manuals are less appropriate for them. The data for the high SES teachers are puzzling, however.

Effective low SES teachers also implied that they take an active role in individual reteaching. This was expected, and it tends to fit with previous data on remediation, reteaching, practice, and drill for low SES students.

Effective low SES teachers also exhibited a favorable attitude towards conduct grades. We suspect that this reflects an attempt to establish and maintain control in the classroom perhaps with the aid of parents.

The statement that a teacher uses her own diagnoses to plan teaching is positively correlated in low SES but negatively in high SES. This is one of several measures which has supported the idea that low SES teachers doubt the usefulness of standardized tests and instead use their own techniques for assessing students. In contrast, high SES teachers stated that they felt that standardized tests were effective enough in measuring their students' ability. Fitting in with this is the variable that teacher uses her own judgment based on the child's performance, i.e. a non-testing situation. This was also positively correlated in low SES.

Low SES teacaers did not use subjective criteria to judge their success. Low SES teachers who produce good student gains reported that they keep up the pace of the class by not waiting, sustaining, or correcting a student answer. If the student didn't answer, they would give the answer or call on someone else. They also reported having a specific approach to "no responses" from students, instead of simply waiting. This is further evidence supporting the process data suggesting that getting some kind of response is important in teaching low SES students. Inverted U curves appear for sustaining a child who is not paying attention, suggesting that there is an optimal level for use of this technique.

Mixed curves appear in low SES for sustaining a student after an incorrect response. The majority of these curves, however, are inverted U-shaped, suggesting that some sustaining is effective but waiting too long or pushing the student too hard becomes counter-productive. U-shaped curves appear in high SES. These are difficult to interpret and suggest some interaction with one or more other variables.

The use of special techniques to teach language arts showed generally conflicting patterns in both groups, and tended to be uninterpretable.

The reported use of non-book materials to teach reading showed two strong negative correlations for high SES classrooms. One interpretation of this is that non-textbook materials are not necessary to teach reading effectively for high SES children, and that the textbooks tend to be adequate for this purpose. However, this would conflict with the variable already discussed that multi-media presentations and use of a variety of sources and techniques were effective in getting across content to high SES children. It is consonant with the finding that high SES effective teachers stick closely to the curriculum.

The teachers' reported arranging of student activities which do not require direct teacher supervision showed one positive correlation for low SES, suggesting that if low SES teachers organize in this way it could allow them more time for individual remedial instruction with their students.

The reported use of T.V. showed inverted U-shaped curves for high SES which had primarily negative slopes suggesting that this was not a generally effective technique. Several high SES teachers did mention that frequently the programming timing did not allow them to use T.V. very much. A high use of spelling bees did reveal one positive correlation for high SES, suggesting, as we have seen before, that competition and challenge were effective here.

Effective high SES teachers reported that they based their judgment of innovations on their social and emotional effect on children. This coincides with some other data suggesting that effective high SES teachers are not completely oblivious to the social or emotional effects of classroom activities on their students, although they do stress cognitive skills. However, they also reported the belief that problems with rapport stem from the child himself, though only one positive correlation was significant.

High SES effective teachers also mentioned concern with the social-emotional needs of Mexican-American children. This was negatively related for effective low SES teachers. It is possibly that, with new busing regulations in Austin, these high SES teachers were meeting Mexican-American and black children for the first time, and that all at once this has become a prime concern to them. In contrast, the effective low SES teachers have had this as a concern for some time, and have managed to deal with it in ways which were somewhat effective, so that it no longer is high on their concern list.

Although effective high SES teachers did not report the frequent use of T.V., they did demonstrate positive attitudes toward T.V.

Low SES effective teachers reported that their reaction to the district's curriculum changes was to change their own teaching. This also was slightly positive for high SES teachers, but less so than for low.

Using a variety of different ways to plan lessons: by subject, by unit, and by time was positively correlated with learning in high SES.

Not publicizing test scores was negatively related for low SES students. Perhaps this prevents children from gaining needed feedback.

Using a humanistic approach and trying to see the child's side showed negatively sloping curves in low SES, suggesting that an overemphasis on this approach is not effective. The relationships for high SES, however, were more positive. This supports other evidence that a discussion with the child of his misbehavior is a more appropriate controlling strategy for high SES children than it is for low SES.

The use of non-punitive techniques instead of isolation or loss of privilege showed inverted U curves in high SES, suggesting that non-punitive techniques work to a point, probably depending upon the severity of the misbehavior. The curves for low SES are less interpretable, however.

Involving children in determining classroom rules also was somewhat positive for high SES, showing inverted U-shaped curves, but less so for low SES, suggesting that high SES children can take part in managing their own behavior to a point at this level, although going too far in allowing children to determine rules becomes counter-productive and can lead to disorder.

The belief that the most common discipline problem is noise and not childrens' disrespect for one another was positively related for high SES effective teachers, and it showed one inverted U-shaped relationship for low SES. Positive relationships were expected here, since they indicate relatively good classroom atmosphere and control.

Discussion

Much discussion of specific findings has already been presented when the findings themselves were presented in this or previous papers, so that the present discussion will focus primarily on the implications of the study for educational research and practice. In general, the study succeeded reasonably well in its primary goal of generating a large number of testable and apparently relevant and useful hypotheses concerning the relationships between teacher behavior and student learning at these grade levels. However, even this general statement requires several qualifications.

First, the many improvements and innovations in the research design that were part of this study succeeded in producing results which open up several new possible lines of investigation and which carry previous findings in other lines of investigation to new (especially to more specific and prescriptive) levels of development, but the study did *not* succeed in meeting one hoped for goal--finding several very strong, replicated relationships between teacher behavior and student learning. With benefit of hindsight, we can now say that the search for such extremely strong relationships appears to have been a naive one doomed to failure from the start. From the perspective of logical analysis, or even from everyday observations, it seems obvious at this point that successful teaching involves orchestrating a large number of principles in such a way as to insure that they are used and used properly at the appropriate moment, as opposed to mastering a short list of "crucial" or "basic" teaching techniques which will insure success in any or all situations. With hindsight and perspective, the search for a few "crucial" teaching behaviors seems clearly futile, if not downright silly. This does not mean that very high relationships between teacher and student learning or other student outcomes can not be obtained, but it means that such extremely strong relationships are only likely to be obtained when several variables of context and of teacher and student individual difference have been taken into account. In short, we need to switch emphasis in teacher effectiveness research from attempts to establish certain behaviors as important and facilitative in all situations to attempts to establish the relationships between certain teacher behaviors and student outcomes in more clearly specified situations involving more clearly specified types of teachers and students.

The preceding comments flow from the general finding of our study that the data are much more interpretable when considered separately by social class than when considered together with the entire sample. Social class, of course, is simply a proxy variable standing for a complex of cognitive and affective individual differences which can be controlled to some degree through measuring social class but ultimately must be examined by studying individual students. Thus, one obvious and important implication for future research in this area is that the individual student be made the unit of analysis and that investigators seek information about the kinds of teaching that optimize outcomes in individual students in addition to teaching that optimizes outcomes for the class as a group.

Failure to collect data on individual students appears to be one of the reasons for the confusing and ambiguous data collected on many of the measures included on this study. Another reason is the need for better control for context differences. The present study was breaking new ground for the most part, so it attempted to study "everything" that went on in the classroom which might relate to student learning. Context was taken into account to some degree in the low inference measures by separating morning vs. afternoon vs. reading group data and by separating response opportunity vs. private work related interaction vs. procedural interaction vs. behavioral interaction (along with the various subdivisions of each of these categories). Given the aims of the present study, such control for context was relatively good. However, future research should control context even more closely, perhaps by concentrating on specific subject matter areas or by concentrating on certain kinds of classroom events (small group reading instruction; whole class discussions; patterned drills; presenting and monitoring seatwork; etc.) Sequential changes in the teacher's goals in such interaction should also be taken into account. For example, teacher behavior which is optimal in situations where the teacher is introducing a new topic should be different from teacher behavior which is optimal in situations where the teacher is reviewing and summarizing a topic.

Many of our measures failed to yield interpretable data because they were too general or ambiguous to be very useful. For example, the category of "new questions" needs to be broken into more meaningful sub-categories. At minimum, new questions intended to provide help to the student and to elicit the answer from him should be separated from new questions which change the focus from getting the answer to the original question to inquiring about whether or not the student has studied the material, has heard the question, etc. Other such categories could also be included here.

A related need on several measures was attention to the quality of appropriateness of the teacher behavior, in addition to simply noting the occurrence or frequency of it. For example, many of the teacher reactions to students during individual work related interactions were simply coded as "brief" or "long." This convention as adapted to accommodate to the fact that many such interactions could not be heard by the coders and this could not be coded with more meaningful categories. However, ultimately such interactions are going to have to be coded with more meaningful categories than simple time designations if valuable information is to be discovered. Similarly, variables such as praise or criticism of students and use of student ideas need to be coded for the appropriateness and effectiveness of the teacher's use of these techniques, not merely for frequency with which the teacher uses them.

Another obvious need is for better measures of affective outcomes. We were aware of this need in the present study, but the measure we used proved not to be useful, and we were left with indirect data on affective outcomes which could be inferred from the behavioral observations. This is of course a general problem in research involving young children, where the search for reliable and valid measures of attitudes toward teacher and school so far has produced relatively little. This search must continue, however, since our data reaffirmed the observations of many others that some teacher behaviors may foster learning but depress student enthusiasm or other cognitive student aspects, or vice versa. Thus, the need for development of reliable and valid measures of affective outcomes that can be used with young students is a serious and important one.

The many contrasts between our findings and those commonly found in the majority of previous studies of teacher behavior suggest the need for several distinctions to be introduced into the literature and for several changes in emphasis in research which is intended to be generalized to the everyday classroom. Perhaps the most obvious implication is that our findings and others based on data taken from naturalistic classroom settings frequently conflict with the findings of data taken from laboratory situations. The implication here seems to be straight forward; investigators wishing to generalize findings to everyday classrooms should collect their data in everyday classrooms.

Another implication is that teachers should be included as consultants--partners in classroom research, particularly in exploratory or hypothesis generating research, as opposed to being kept in the dark or treated as individuals who don't know anything about teaching. Our self-report data suggest that, by and large, the observations and opinions of teachers concerning what is best for the children are fertile and largely correct sources of hypotheses. This is not to say that teachers are clearly aware of everything that they do in the classroom or that the usual cautions against bias and erroneous information due to self-deception should be ignored. However, it appears that most of the studies showing teacher perceptions to be inaccurate deal with matters that the teachers do not usually think about or do not have any special reason to know about (sociometric peer relationships; differences in the ways that teachers interact with different individual students in the classroom, particularly on dimensions which have never been brought to their attention). In contrast, when teachers are asked about areas which they _do_ think about (particularly matters of curriculum and instruction and of how the teacher should adapt the curriculum and materials available to meet the needs of individual children), their observations seem to be particularly insightful and worth investigators' attention.

The observations of Soar (1972) and the findings of the present study, among other sources, point to the need for _routinely_ investigating non-linear as well as linear relationships between teacher behavior and student outcomes. This point has been made several times by many individuals, but the fact remains that it is not often done. The present study has shown that many relationships which do not appear in correlational analyses are revealed when non-linear analyses are performed, and, more importantly, that most teacher behaviors are related non-linearly to student outcome measures. Reflection suggests that most teacher behaviors should be related to student outcome measures in non-linear fashion, if our interpretation that teaching is a matter of orchestrating a large number of principles in the proper fashion rather than mastering a few central principles is correct. Statistical programs which allow these kinds of analyses are now available in forms that can be easily used; consequently, we suggest that they should be used and used regularly.

Another important point highlighted by the findings of the present study is that teaching in the early grades, when the emphasis is on presentation and mastery of largely physical tool skills, is qualitatively different in many ways from teaching in later grades, where the emphasis is on verbal presentation and discussion of largely symbolic material. We believe that this distinction is a fundamental one, and should be introduced into the literature and taken into consideration when evaluating research results. Combining data from the early grades or from preschool with data from the later grades or secondary schools amounts to mixing apples with oranges, and is more likely to confuse than to shed light on an issue. Thus, we would stress the need for investigators to conceptualize, study, and discuss teaching in these different areas as two different enterprises. A corollary of this implication for future research is the implication that, ultimately, teachers trained for teaching in the early elementary grades should be trained differently (probably in separate programs) from teachers trained for the later elementary grades. The present division of elementary teaching vs. secondary teaching appears to be too general.

This suggestion makes sense not only from the perspective of research and teaching, but also from the data from child development and related fields. The learning styles of children who are functioning at what Piaget would call a preoperational level (children in the first few grades) differ from the learning styles of children who have achieved the concrete operational level. These differences in children have important implications, not only for what is or is not appropriate curriculum, but also for what is or is not appropriate teaching methods and goals. The point could be expanded at length, but in any case it seems reasonable to us to state that learning in the first few grades is qualitatively different from learning in the middle grades, so much so that separate teacher training is in order.

The present research provided tentative answers to a large number of questions, but also raised a number of questions and left many others unanswered. The latter problem occurred because of some of the methodological deficiencies mentioned earlier, and also because in many cases the relevant data could not be obtained because the teacher-student interactions involved did not occur often enough to allow meaningful analyses to be performed. In many cases, this may simply mean that the interaction in question is not very important because it does not happen much, but some relatively infrequent interactions are important because of their intensity. In any case, many relationships that we wished to investigate could not be studied because there were no data or not enough variance among the teachers.

The problem of limited variance brings out a point that was mentioned before but is worth repeating again: the probability values given in the tables for this study should not be taken at face value, and should be used as only rough indicators of the strength of relationships. They study involved a large number of variables and a small number of subjects, so that one of the basic assumptions underlying the use of inferential statistics was violated. Furthermore, in many cases the data involved very low N's or unusual distributions that departed drastically from normality. We considered correcting for attenuation, but this seemed to be a futile exercise because even this procedure assumes many things that were not present in the study.

Th upshot of all this is that the real probability of a given finding is unknown and for all interts and purposes unknowable. This also goes for the probability of finding a given percentage of our relationships to be "statistically significant," regardless of what significance level is chosen as "significant." Given that a very large number of variables were included in an attempt to study "anything" which might be related to student learning, that many variables had no data, no variance, and/or drastically abnormal distributions, and that many variables had ipsative relationships with one another, it simply is not possible to ascertain the probability level of a given finding or to estimate with any confidence the percentage of findings which "should be expected" to be statistically significant at a given probability level.

Our attempt to deal with this problem involved a two-stage plan. The first was to include a replication year in the correlational study itself. These data have been presented already, and the degree to which a finding replicates is one clue as to its validity and stability. The second, and ultimately the more definitive, method of establishing which findings are real and will hold up is to move from correlational to experimental designs. One such study has already been completed (Crawford, 1974). It is mentioned briefly as an example of the kind of study that can take one of the correlational findings from the present work and convert it into an experiment designed to test out causal relationships. This study began with the observation noted earlier that the difficulty level of teacher questions (and, consq[illegible]y, the percentage of correct answers by students) appeared to be curvilinearly related to student learning. The most successful teachers in high SES schools had about 70% of their questions answered correctly, while the most successful teachers in low SES schools had about 80% of their questions answered correctly. These findings suggested that the optimal difficulty level would be questions that could be answered correctly about 3/4 of the time with the additional implication that the optimal level of difficulty for low ability students would be somewhat lower (easier) than the optimal level for high ability students.

Crawford (1974) tested this hypothesis by investigating the learning of college students studying programmed materials arranged at difficulty levels (correct answer rates) of about 43%, 85%, and 96%, respectively. As predicted, the subjects in the 85% difficulty group learned the material significantly better than subjects in either of the other two groups. This was a pilot study conducted on a small number of subjects which presently is being replicated on a much larger number of subjects and with some additional experimental conditions, but it provides support for the curvilinear relationships found in the present study. It also exemplifies the kind of experimental study that can be conducted as a natural follow-up to one or more of the correlational findings from the present study.

Another example is a larger experimental study we have underway presently which ties together several principles of reading group instruction into an integrated system which is taught to experimental (treatment) teachers. This study will determine whether experimental teachers taught to use these principles systematically produce better cognitive and/or affective outcomes than control teachers. In addition, both groups will be observed and coded for their use of each principle, so that the effects of each separate principle can be evaluated in addition to evaluation of the treatment as an integrated system.

We invite and encourage our research colleagues to conduct other experimental tests of the possible causal relationships underlying the correlational findings of this research, particularly through experiments involving realistic treatments in naturalistic settings.

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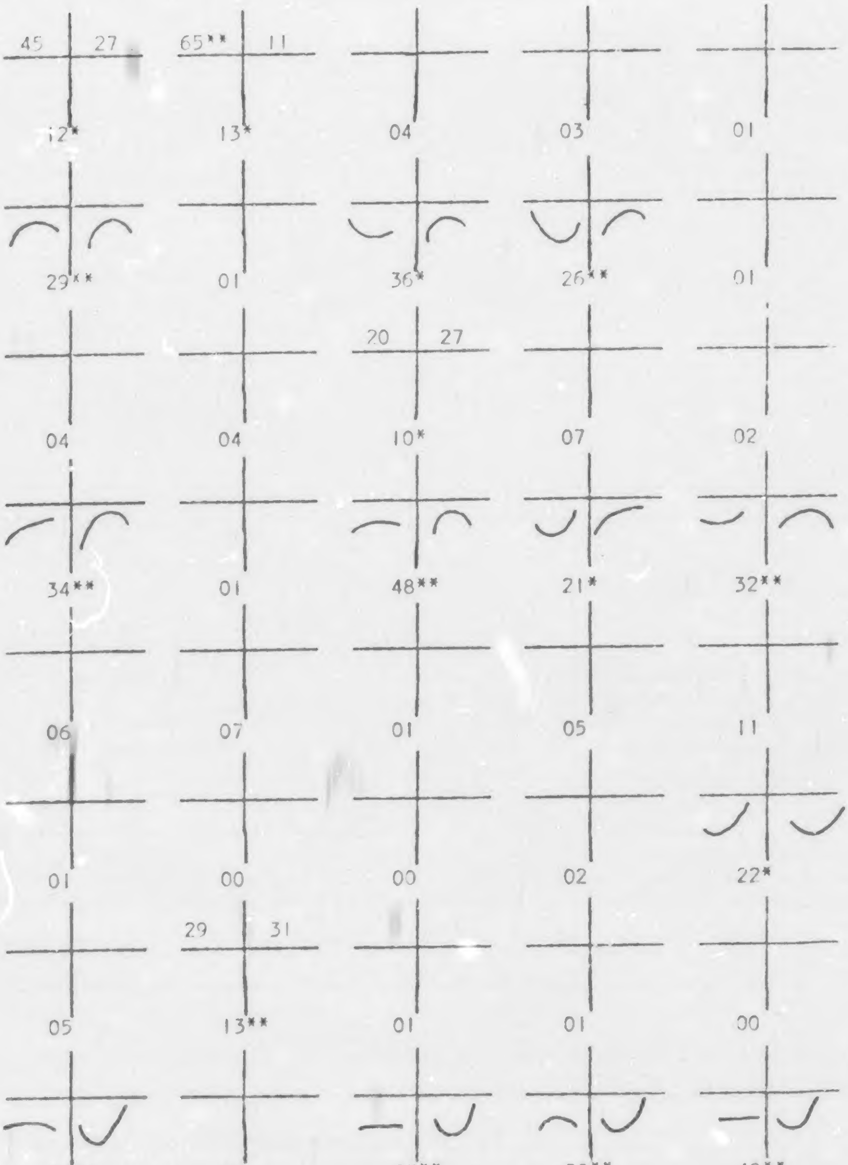
Table 1. Non-linear Process-Product Relationships between Classroom Observation Scales and Student Residual Gain Scores (averaged across four years) on the Metropolitan Achievement Tests (decimal points omitted).[1]



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
1.	High Level of Student Attention					
	Reading Group Mean Year 2	45 27 12*	65** 11 13*	04	03	01
	General Class Mean Year 2	29**	01	36*	26**	01
	Mean for Total Year 1	04	04	20 27 10*	07	02
	Mean for Total Year 2	34**	01	48**	21*	32**
2.	Teacher Often Addresses Questions or Problems to the Whole Class					
	Reading Group Mean Year 2	06	07	01	05	11
	General Class Mean Year 2	01	00	00	02	22*
	Mean for Total Year 1	05	29 31 13**	01	01	00
	Mean for Total Year 2	29**	00	23**	30**	49**

Table I, Cont'd.

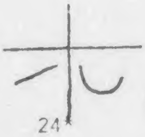
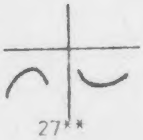
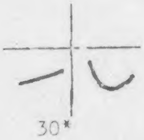
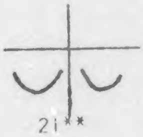
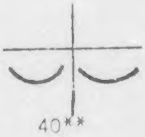
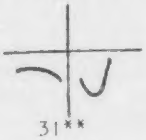
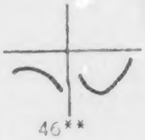
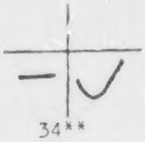
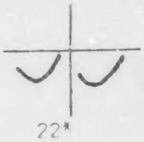
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
3.	Teacher is Task Oriented, Doesn't Waste Time Reading Group Mean Year 2	 24*	66** 13 07	07	 27**	 30*
	General Class Mean Year 2	01	03	02	 21**	 40**
	Mean for Total Year 1	07	47 12 09*	17 24 10*	02	01
	Mean for Total Year 2	01	01	03	01	00
4.	Frequent Pupil-to-Pupil Interaction (Class Relevant) Reading Group Mean Year 2	-61** -14 09	01	06	-05 -48* 05	03
	General Class Mean Year 2	 31**	 46**	 34**	01	 22*
	Mean for Total Year 1	00	05	01	59** 05 04	03
	Mean for Total Year 2	-51* 10 01	01	01	00	00

Table I, Cont'd.

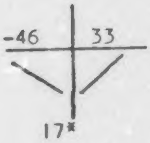
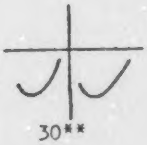
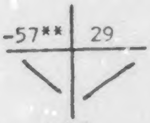
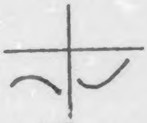
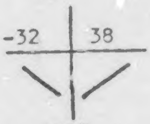
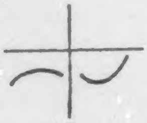
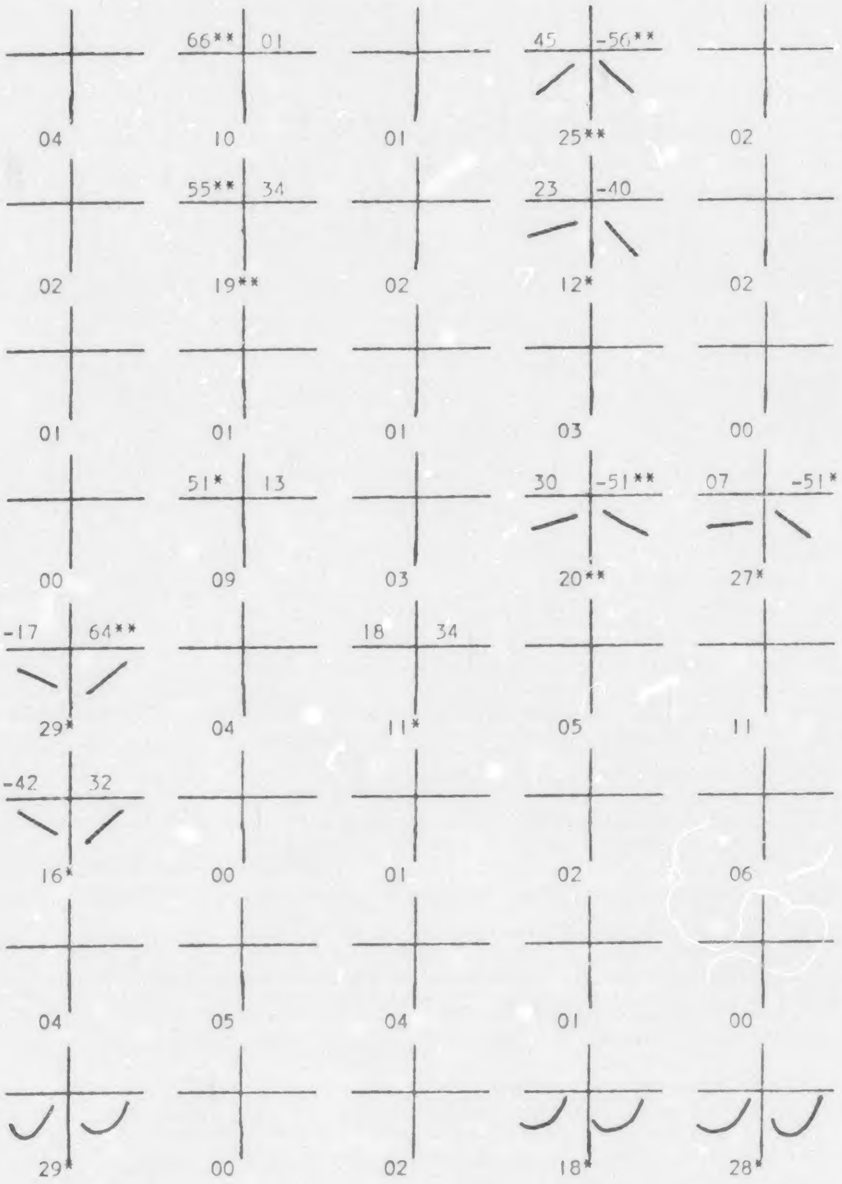
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
5.	% of Time Teacher Lectures or Demonstrates					
	Reading Group Mean Year 2	 -46 33 17*	 30**	02	01	01
	General Class Mean Year 2	-67** -02 04	-60** -33 17**	02	01	02
	Mean for Total Year I	36 33 13**	22 41* 16**	04	02	01
	Mean for Total Year 2	 -57** 29 19**	05	01	00	01
6.	Negative Affect: Criticism, Hostility					
	Reading Group Mean Year 2	 29*	 -32 38 15**	 41*	05	09
	General Class Mean Year 2	01	00	04	02	00
	Mean for Total Year I	01	05	03	00	00
	Mean for Total Year 2	00	00	00	00	02

Table I , Cont'd.

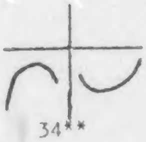
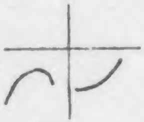
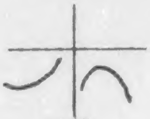
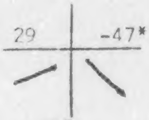
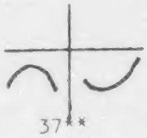
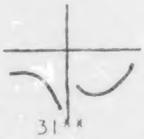
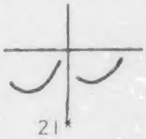
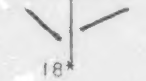
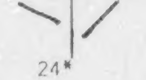
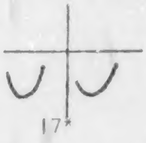
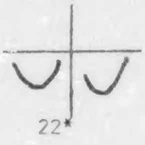


Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
7.	Positive Affect: Praise, Support					
	Reading Group Mean Year 2	04	66** 01 10	01	45 -56** 25**	02
	General Class Mean Year 2	02	55** 34 19**	02	23 -40 12*	02
	Mean for Total Year 1	01	01	01	03	00
	Mean for Total Year 2	00	51* 13 09	03	30 -51** 20**	07 -51* 27*
8.	Requires High Level of Generalization, Inference, or Explanation					
	Reading Group Mean Year 2	-17 64** 29*	04	18 34 11*	05	11
	General Class Mean Year 2	-42 32 16*	00	01	02	06
	Mean for Total Year 1	04	05	04	01	00
	Mean for Total Year 2	29*	00	02	18*	28*

Table 1, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
9.	High Student Withdrawal, Passivity, or Aimless or Repetitive Behavior Reading Group Mean Year 2	-43 -44 17**	07	07	03	05
	General Class Mean Year 2	05	02	34*	00 -08** 30**	05
	Mean for Total Year 1	02	01	04	01	00
	Mean for Total Year 2	-22 -56** 26*	02	-35 -45* 12*	-09 -46* 06	04
10.	Clarity: Students Show Clear Understanding of Teacher Presentations Reading Group Mean Year 2	23**	67** 10 07	03	58** -18 19**	00
	General Class Mean Year 2	01	54* 35 06	04	21*	32**
	Mean for Total Year 1	04	03	06	04	02
	Mean for Total Year 2	00	62** 06 04	01	01	02

Table I, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
11.	Enthusiasm: Teacher Shows Enthusiasm, Excitement, Enjoyment					
	Reading Group Mean Year 2	 34**	 38*	04	47* -19 03	01
	General Class Mean Year 2	00	53* 41 14**	01	00	04
	Mean for Total Year 1	00	00	00	00	01
	Mean for Total Year 2	01	53* 16 07	01	 40**	29 -47*  25*
12.	Convergent Questioning: Most Questions Have Clear-Cut Correct Answers					
	Reading Group Mean Year 2	 37**	 31**	 21*	-55** 18  18*	-45 47  24*
	General Class Mean Year 2	00	02	 17*	01	 22*
	Mean for Total Year 1	06	04	00	00	00
	Mean for Total Year 2	05	01	03	01	07

[1] Probability values are indicated by asterisks. One asterisk indicates a value of ≤ .10; two asterisks indicate a value of ≤ .05.

Table 2. Non-linear Process-Product Relationships between Coder Check-list Items and Student Residual Gain Scores (averaged across four years) on the Metropolitan Achievement Tests (decimal points omitted).[1]

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
Methods of Handling Catch-up Work						
1.	No Remediation; Child Skips Missed Work	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		01	01	17*	02	00
2.	Child Must Make Up Work But is Not Given Help	ND ND 00	ND ND 01	ND ND 01	ND ND 00	ND ND 02
		00	02	07	05	00
3.	Teacher Explains Work and Has Child Do Part of It	ND ND 07	ND ND 03	ND ND 03	ND ND 04	ND ND 01
		-12 59** 28**	02	04 47* 13*	-51* 23 14*	29*
4.	Another Child is Assigned to Help	ND ND ND ND 01	ND ND ND ND 00	ND ND ND ND 02	ND ND ND ND 02	ND ND ND ND 04
		00	02	0[illegible]	01	00

Table 2, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
5.	Child Put in Slower Group Temporarily	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
6.	Other	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
	Rules Regarding Physical Movement					
7.	Must Always Get Permission to Leave Seat	00	03	22**	14*	01
		ND ND ND ND 04	ND ND ND ND 05	ND ND ND ND 17**	ND ND ND ND 10	ND ND ND ND 24**
8.	One at a Time Without Permission	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND 03	ND ND ND ND 01	ND ND ND ND 03	ND ND ND ND 02	ND ND ND ND 00

Table 2, Cont'd.

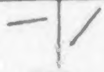
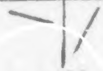
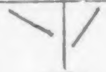
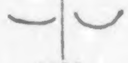
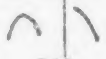
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
9.	As Many as 4 or 5 Without Permission	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
10.	Can Go Quietly to Specified Places Without Permission at Any Time	-50* 15 00	03	00	00	00
		01 57**  26*	03	-23 51**  24**	-23 53**  20**	 60**
11.	No Restrictions	00	00	00	00	 24*
		ND ND ND ND 00	ND ND ND ND 01	ND ND ND ND 03	ND ND ND ND 05	ND ND ND ND 05
12.	Some Children Allowed Free Movement but Not Others	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 2 , Cont'd.

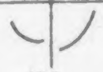
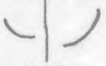
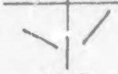
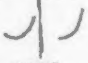
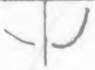
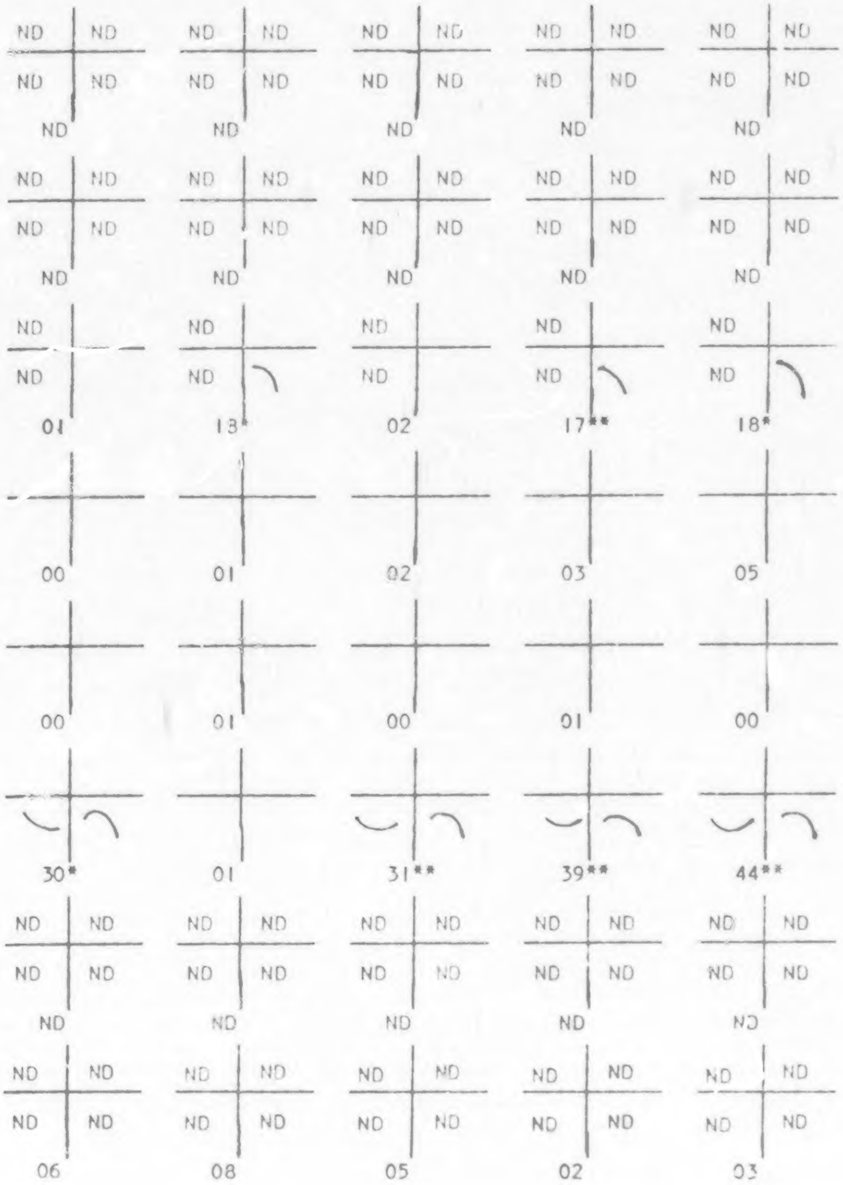
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
13.	Only Monitors Allowed Free Movement	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
14.	Other	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
	Punishments Used By Teachers					
15.	Stay After School	01	01	78** 11 09*	03	02
		 45*	 42**	-10 54**  26**	 25**	 40*
16.	Spanking	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND 06	ND ND 00	-06 ND ND 25**	39 ND ND 35**	35 ND ND 21**

Table 2, Cont'd.

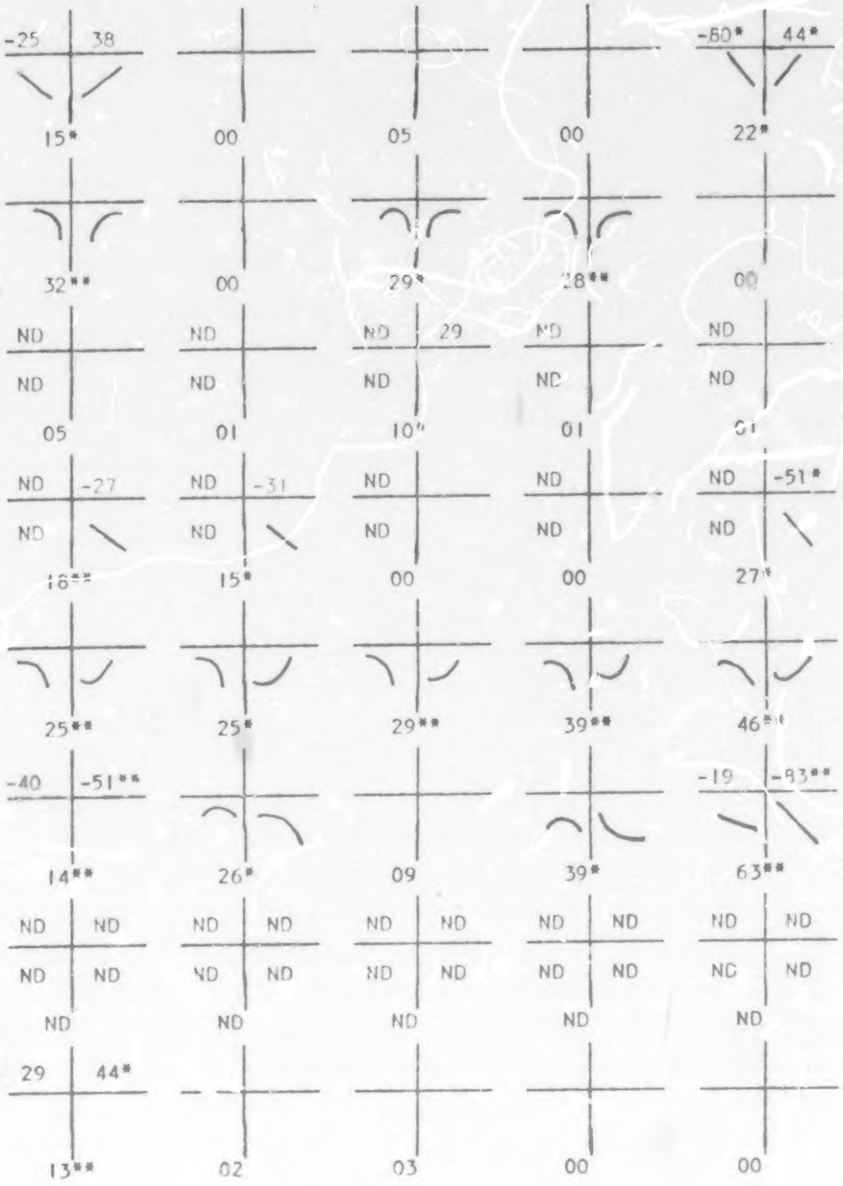


Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
17.	Writing Sentences on Board	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
18.	Isolation Within the Classroom	ND ND 01	ND ND 13*	ND ND 02	ND ND 17**	ND ND 18*
		00	01	02	03	05
19.	Removal from the Classroom	00	01	00	01	00
		30*	01	31**	39**	44**
20.	Note to Parents	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND 06	ND ND ND ND 08	ND ND ND ND 05	ND ND ND ND 02	ND ND ND ND 03

Table 2 , Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
21.	Send to Principal	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND 02	ND ND ND ND 04	ND ND ND ND 01	ND ND ND ND 01	ND ND ND ND 00
22.	Extra Reading, Math, etc., Work	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
23.	Peer Pressure (e.g., "You Lost the Race for Your Group.")	ND ND 01	ND ND 00	ND ND) 23**	ND ND) 15*	ND ND 00
		-16 45* \ / 18*	02	02	00	01
24.	Scolding	01	00	00	02	03
		02	-59** 51** \ / 31**	00	00	07

Table 2 , Cont'd.

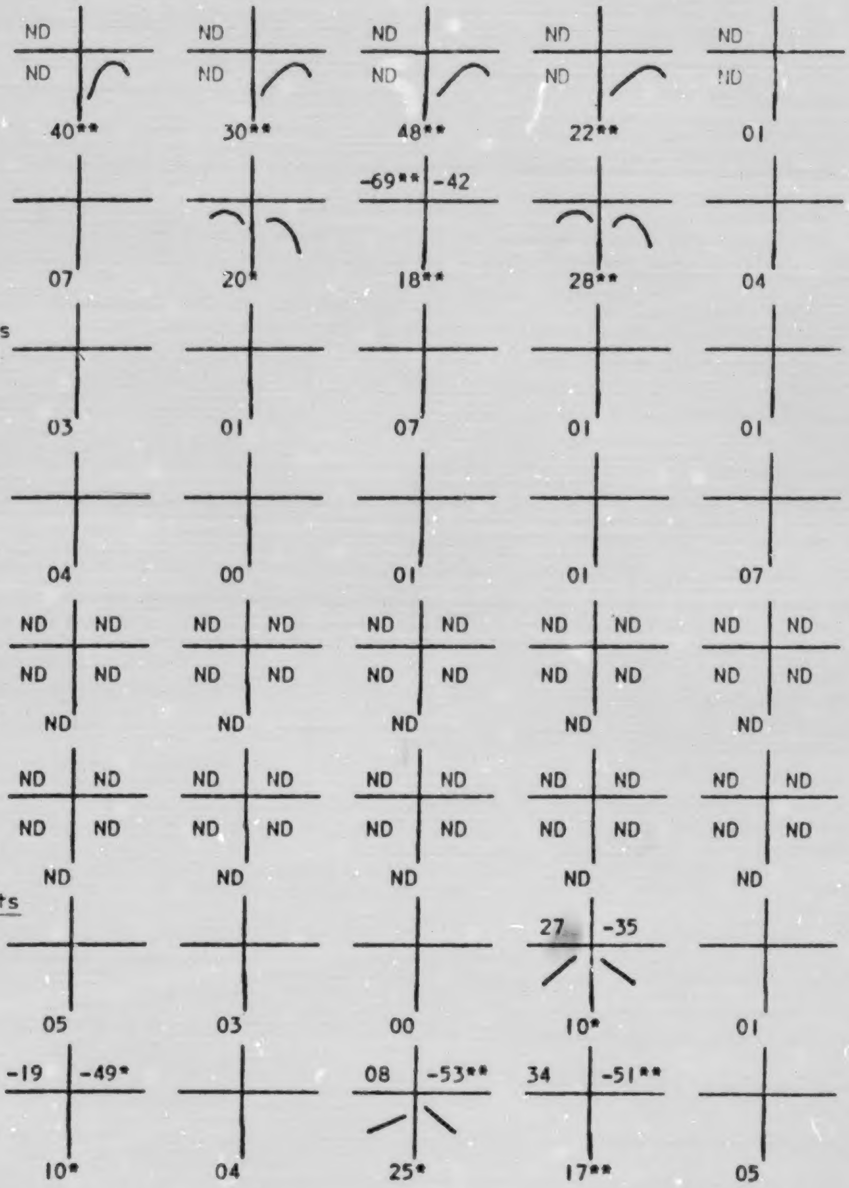


Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
25.	Discussion of Incident (No Scolding)	-25 38 15*	00	05	00	-60* 44* 22*
		32**	00	29*	28**	00
26.	Other	ND ND 05	ND ND 01	ND 29 ND 10"	ND ND 01	ND ND 01
		ND -27 ND 18**	ND -31 ND 15*	ND ND 00	ND ND 00	ND -51* ND 27*
	Rewards Used by Teacher					
27.	Classmates Clap or Cheer	25**	25*	29**	39**	46**
		-40 -51** 14**	26*	09	39*	-19 -83** 63**
28.	Special Privileges	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		29 44* 13**	02	03	00	00

Table 2, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
29.	Waiver or Reduction of Assignments	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND 08	ND ND ND ND 01	ND ND ND ND 07	ND ND ND ND 02	ND ND ND ND 04
30.	Symbols (Stars, Smiling Faces, etc.)	00	00	02	00	03
		04	52* 46* 21**	00	07	63* 01 06
31	Tokens Redeemable for Other Rewards	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
32.	Concrete (Candy, Money, Prizes)	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND 01	ND ND ND ND 01	ND ND ND ND 00	ND ND ND ND 01	ND ND ND ND 00

Table 2, Cont'd.

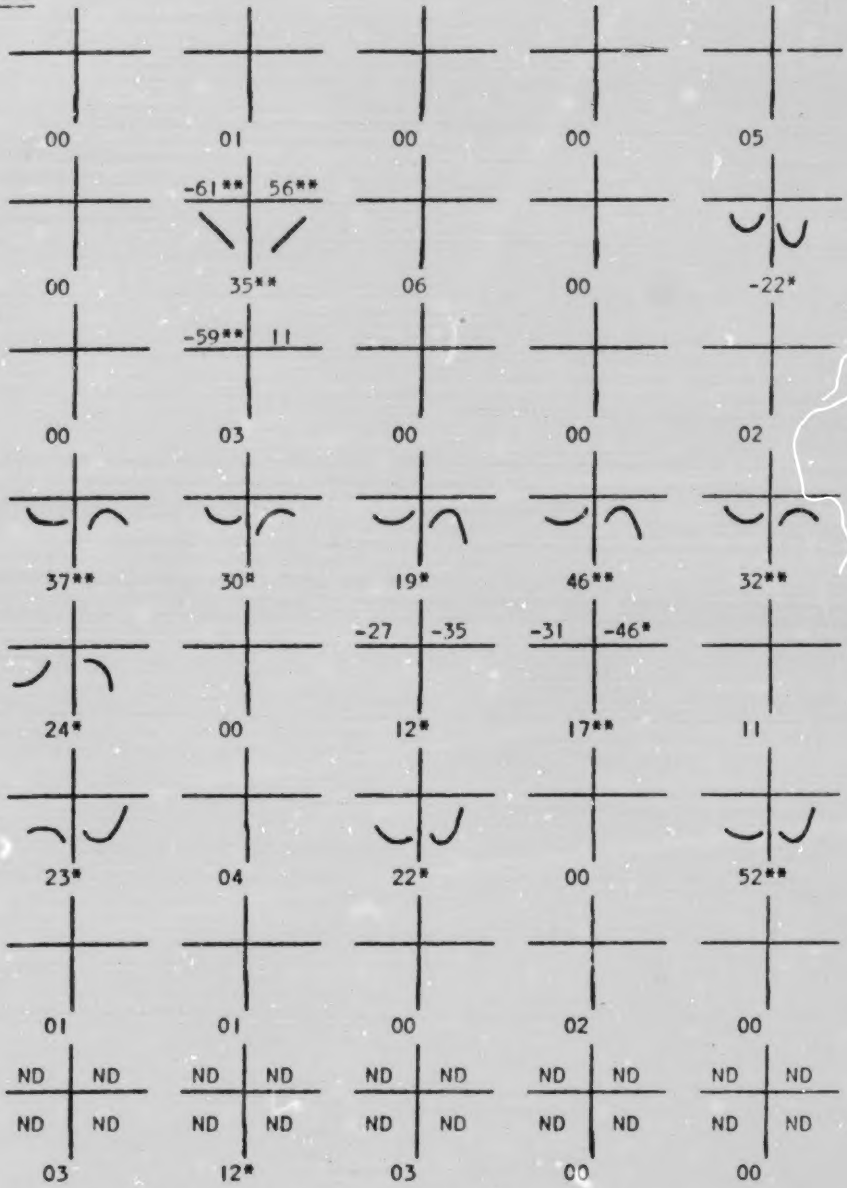


Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
33.	Jobs (Monitor, Helper, Eraser, Cleaner)	ND ND 40**	ND ND 30**	ND ND 48**	ND ND 22**	ND ND 01
		07	20*	-69** -42 18**	28**	04
34.	Public Recognition (Gets to Read or Work Problem on Board)	03	01	07	01	01
		04	00	01	01	07
35.	Other	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
	Appropriateness of Assignments					
36.	Too Short or Easy	05	03	00	27 -35 10*	01
		-19 -49* 10*	04	08 -53** 25*	34 -51** 17**	05

Table 2 , Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
37.	Boring, Repetitive, Monotonous	27 -45* 20**	00	29 -33 15*	17*	02
		01	00	21**	20*	06
38.	Too Hard: Students Can't Get Started or Continually Need Help	01	02	04	00	00
		ND ND 00	-48* ND ND 03	-57** ND ND 03	ND ND 00	ND ND 06
39.	Continued Activity Too Long, Until It Gets Boring	08	05	06	01	00
		04	35**	09 -45* 10*	33 -49* 20**	59* -49* 30**
40.	No Inappropriate Assignments	04	05	20 40 16**	28 44* 12*	06
		00	61** 07 05	03	47* 06 04	01

Table 2 , Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computatic	Arithmetic Reasoning
	Distractions: What do Students Do When not Working?					
41.	Use Washroom	00	01	00	00	05
		00	-61** 56** 35**	06	00	-22*
42.	Repeatedly Get Supplies for Free Time Activities	00	-59** 11 03	00	00	02
		37**	30*	19*	46**	32**
43.	Watch Reading Group or Other Activity	24*	00	-27 -35 12*	-31 -46* 17**	11
		23*	04	22*	00	52**
44.	Talk	01	01	00	02	00
		ND ND ND ND 03	ND ND ND ND 12*	ND ND ND ND 03	ND ND ND ND 00	ND ND ND ND 00

Table 2, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
45.	Play	00	05	00	∪ │ ⌒ 18*	82** │ 13 02
		-47* │ 23 00	⌒ │ ⌒ 33*	01	04	10
46.	Daydream	03	06	-49* │ -04 06	-48* │ 11 02	00
		⌒ │ ⌒ 22*	01	07	∪ │ ∩ 28**	00
47.	Ask for Help or Look More Closely at Work on Board	00	01	∩ │ ∩ 20*	05	06
		-48* │ -25 12*	-69** │ -10 12*	01	01	02
48.	Disrupt Other Students	00	01	01	00	00
		⌒ │ ⌒ 17*	06	⌒ │ ∩ 30**	-47* │ -04 02	01

Table 2, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
49.	Other	26 | ND / | ND 15*	| ND | ND 03	-23 | ND | ND 13**	| ND ∩ | ND 34*	| ND | ND 04
		ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND
	Student Attitudes Toward the Teacher					
50.	When Having Trouble Students Concentrate or Seek Help	02	01	00	01	03
		/ | ⌒ 37**	48* | 00 05	◡ | ⌒ 29**	◡ | ⌒ 16*	◡ | ⌒ 22*
51.	When Having Trouble Students Merely Copy from Neighbor	-68** | -10 08	-68** | -10 14**	05	01	| ND | ND 00
		-67** | 10 03	-51* | 09 02	03	00	05
52.	Students Work as Well When Not Watched as When Watched	01	01	◡ | ◡ 27**	02	05
		⌒ | ⌒ 20**	00	02	05	03

Table 2, Cont'd.

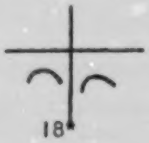
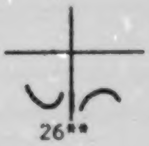
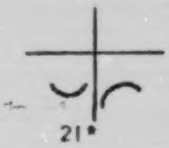
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
53.	Students "Act Up" When Unwatched	00	04	00	01	01
		 18*	00	01	 26**	 21*
54.	Students Seem Amused by Teacher	ND ND 00	ND ND 00	ND ND 00	ND ND 01	ND ND 00
		ND ND ND ND 04	ND ND ND ND 00	ND ND ND ND 08	ND ND ND ND 05	ND ND ND ND 02
55.	Students Seem to Fear Teacher	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND 02	ND ND ND ND 00	ND ND ND ND 00	ND ND ND ND 02	ND ND ND ND 02
56.	Students Seem to Respect Teacher	02	02	00	01	00
		04	03	06	00	00

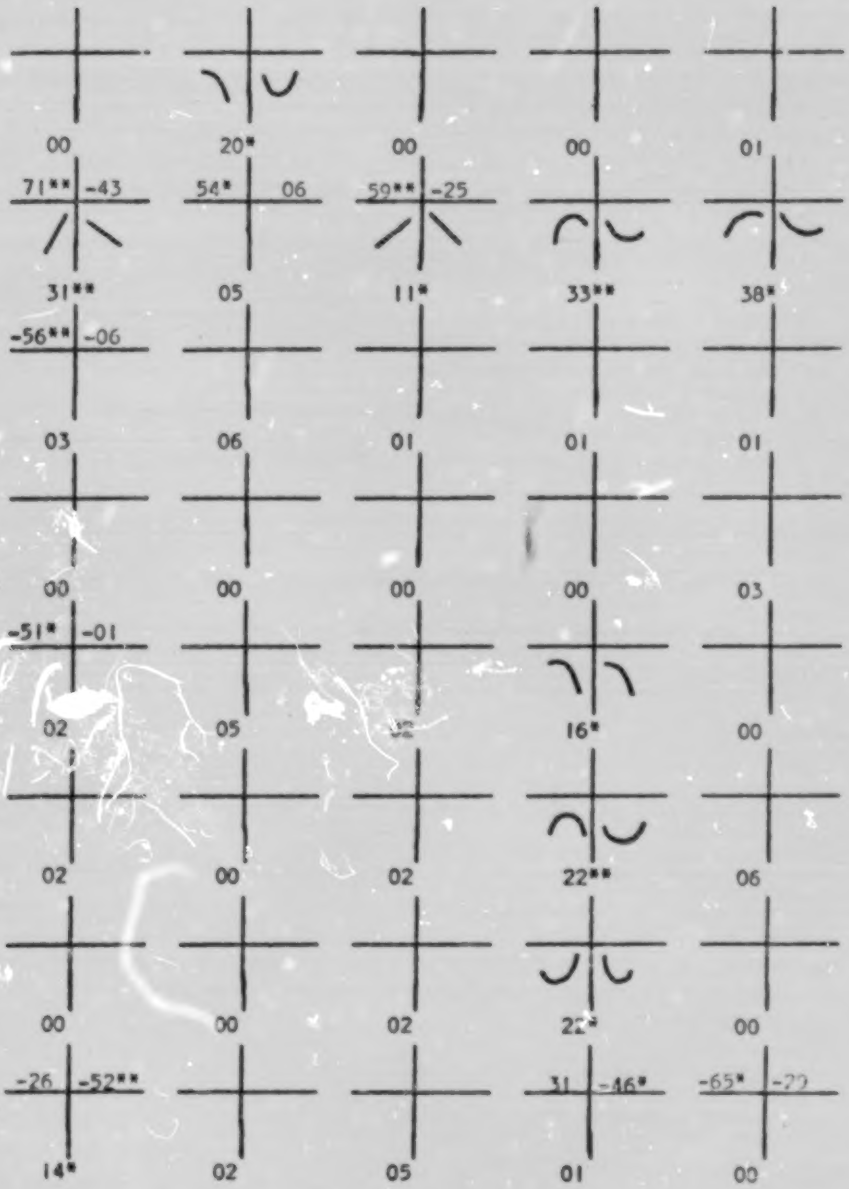
Table 2 , Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
	Free Time Materials Available (Not Necessarily Used)					
57.	Books	-10 | -45* ╲ ╲ 19*	01	-28 | -54** ╲ ╲ 29*	-38 | -30 10*	-33 | -46* 16*
		ND | ND ND | ND 04	ND | ND ND | ND 07	ND | ND ND | ND 10*	ND | ND ND | ND 01	ND | ND ND | ND 09
58.	Learning Centers (Any)	ND ND 01	ND ND 04	ND ND 04	ND ND 00	ND ND 01
		33 | -50** ╱ ╲ 24**	55** | -12 ╱ ╲ 14*	⌒ ∪ 33*	⌒ ∪ 33*	30 | -61** ╱ ╲ 37**
59.	Listening Centers	00	00	00	∪ ∪ 15*	08
		56** | -41 ╱ ╲ 24**	⌒ ∪ 32*	21 | -48* ╱ ╲ 21*	00	03
60.	Visual (Picture Files, Filmstrips)	74** | -12 01	02	00	01	01
		01	03	⌒ ∪ 20*	⌒ ∪ 33**	12

Table 2, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
61.	Science Demonstrations or Experiments	ND / ND / 02	ND / ND / 19*	ND / ND / 01	ND / ND / 00	ND / ND ND / ND ND
		-25 / ND / ND 29*	-03 / ND / ND 21**	/ ND / ND 02	/ ND / ND 00	/ ND / ND 05
62.	Other Learning Centers	ND / ND ND / ND 03	ND / ND ND / ND 00	ND / ND ND / ND 00	ND / ND ND / ND 02	ND / ND ND / ND 04
		ND / ND ND / ND 04	ND / ND ND / ND 04	ND / ND ND / ND 04	ND / ND ND / ND 03	ND / ND ND / ND 03
63.	Coloring Pictures	00	05	[illegible]	01	00
		00	06	00	00	03
64.	Painting, Art Activities	04	09	33 / -33 16*	01	08
		18*	04	00	02	59* / -16 00

Table 2 , Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
65.	Games, (Any)	00	20*	00	00	01
		71** -43 31**	54* 06 05	59** -25 11*	33**	38*
66.	Instructional Games	-56** -06 03	06	01	01	01
		00	00	00	00	03
67.	Non-instructional Games	-51* -01 02	05	02	16*	00
		02	00	02	22**	06
68.	Aquarium, Other Looking Exhibits	00	00	02	22*	00
		-26 -52** 14*	02	05	31 -46* 01	-65* -29 00

Table 2, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
	Free Time Materials Observed In Use					
69.	Books	01	04	01	07	04
		00	01	00	00	00
70.	Learning Centers (Any)	ND ND 04	ND ND 01	ND ND 06	ND ND 17*	ND ND 01
		34 -53** 26**	55** -11 01	36 -38 15*	48* -39 19**	24 -64** 18**
71.	Listening Centers	01	00	60** 02 04	01	08
		07	28**	06 -51** 23*	30 -38 13*	33*
72.	Visual (Picture Files, Filmstrips)	58** 33 16**	08	07	02	02
		07	00	-55** -18 07	30**	32*

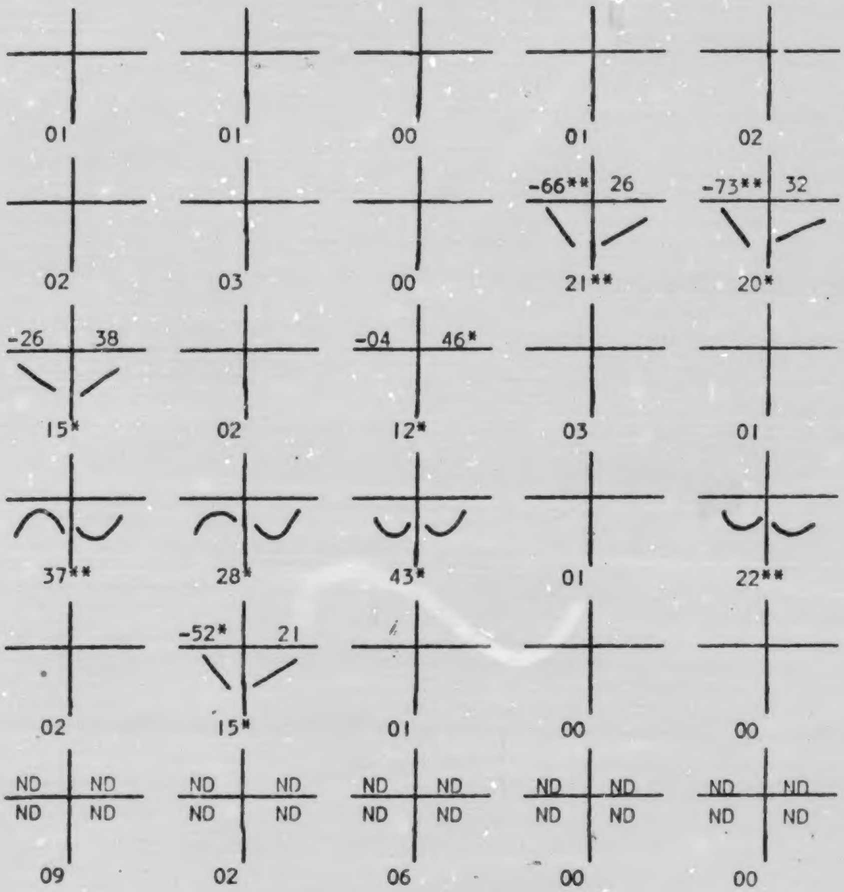
Table 2, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
73.	Science Demonstration or Experiments	ND | ND | ∩ 22*	ND | ND | ╮ 22*	ND | ND | 08	ND | ND | 01	ND | ND | 03
		ND | ND ND | ND 03	ND | ND ND | ND 02	ND | ND ND | ND 00	ND | ND ND | ND 04	ND | ND ND | ND 14
74.	Other Learning Centers	ND | ND | 04	ND | ND | 00	ND | ND | 00	ND | ND | 02	ND | ND | 06
		ND | ND ND | ND 01	ND | ND ND | ND 06	ND | ND ND | ND 13	ND | ND ND | ND 10*	ND | ND ND | ND 03
75.	Coloring Pictures	02	01	01	00	00
		00	03	00	00	03
76.	Painting, Art Activities	01	╯ | ∪ 27**	╯ | ∪ 20*	00	08
		⌒ | ∩ 15*	04	51* | -13 00	00	01

Table 2 , Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
77.	Games (Any)	00	02	00	00	01
		79** -34 / \ 30**	⌒ ∪ 29**	53* -11 01	⌒ ∪ 40**	⌒ ∪ 39**
78.	Instructional Games	00	02	02	∩ ∩ 15**	01
		02	01	01	02	08
79.	Non-Instructional Games	00	03	00	00	∪ ∩ 29*
		04	02	02	04	10
80.	Aquariums, Other Looking Exhibits	ND ND 01	ND -10 ND \ 19**	ND ND 01	ND ND 02	ND ND 01
		ND ND ND ND 10*	ND ND ND ND 00	ND ND ND ND 11*	ND ND ND ND 02	ND ND ND ND 00

Table 2, Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
81.	Use of Peer Tutoring	01	01	00	01	02
		02	03	00	-66** 26 21**	-73** 32 20*
82.	Assigns Homework Besides Seatwork	-26 38 15*	02	-04 46* 12*	03	01
		37**	28*	43*	01	22**
83.	Teacher Sometimes Underreacts to Control Problems, So Serious Problems Go Unresolved	02	-52* 21 15*	01	00	00
		ND ND ND ND 09	ND ND ND ND 02	ND ND ND ND 06	ND ND ND ND 00	ND ND ND ND 00

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[1] Probability values are indicated by asterisks. One asterisk indicates a value of $\leq .10$; two asterisks indicate a value of $\leq .05$.

Table 3. Non-linear Process-Product Relationships between Coder Ratings and Student Residual Gain Scores (averaged across four years) on the Metropolitan Achievement Tests (decimal points omitted).[1]

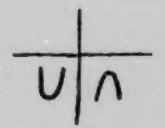
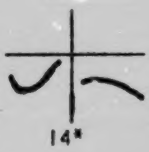
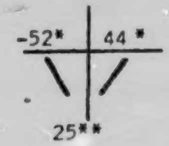
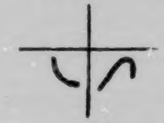
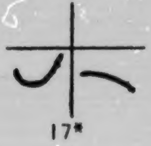
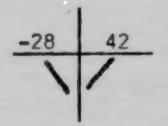
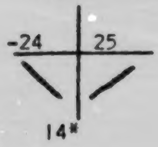
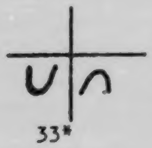
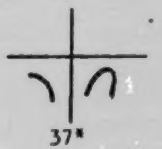
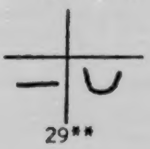
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
	Coder Ratings					
1.	Typical Affectionateness Level	07	02	 29*	04	01
		01	04	02	 14*	03
2.	Most Intense Affection Expression Observed	-52* 44 *  25**	00	05	08	 56**
		01	07 24 10*	01	 17*	01
3.	Most Intense Negative Affect Observed	03	03	00	-28 42  15*	02
		-24 25  14*	00	00	00	08
4.	Solidarity With Class: Teacher Identifies, Promotes "We" Feeling	 33*	03	 37*	00	-83** 20 00
		00	06	 29**	01	00

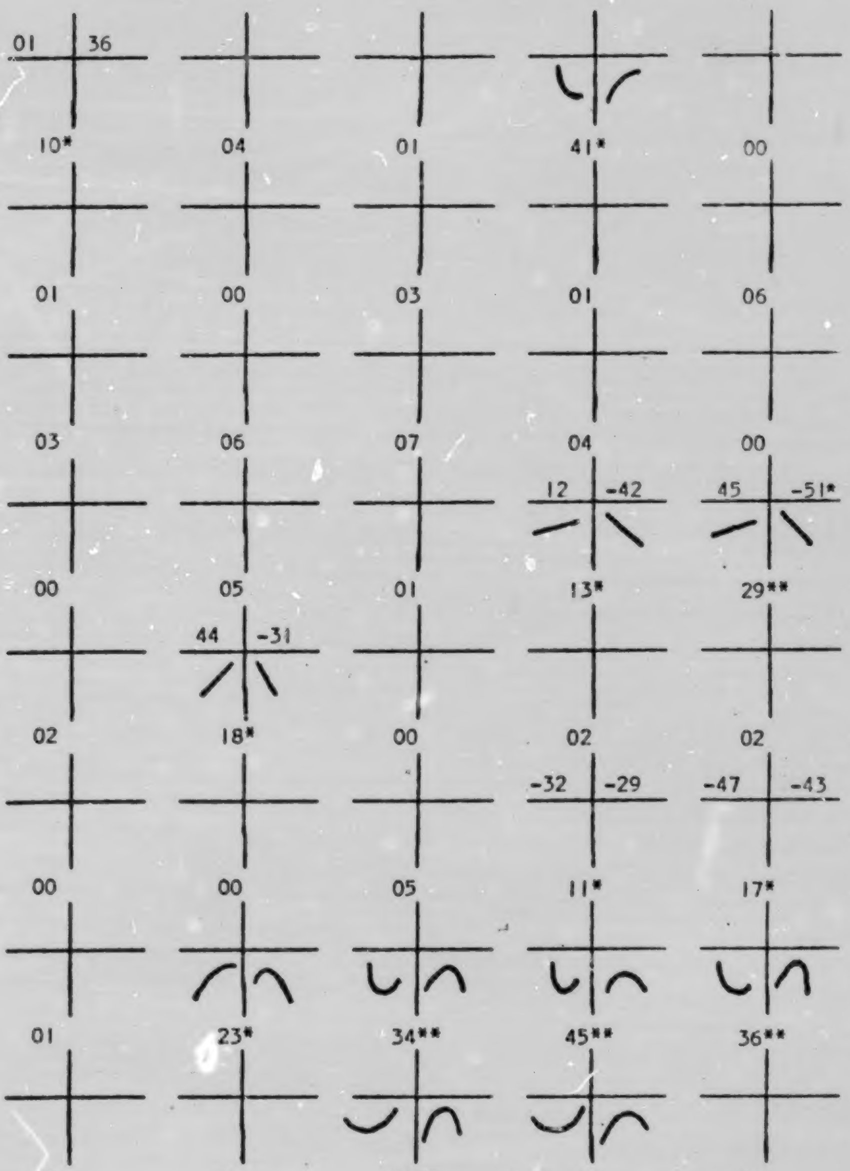
Table 3 , Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
5.	Patient and Supportive When Correcting	04	00	01	00	00
		01	14*	03	06	-20 -46* 19**
6.	Students Allowed Choice In Assignments	00	00	00	04	06
		03	08 31 10*	02	04 45* 10*	04
7.	Accepts Student Ideas and/or Integrates Them Into Discussion	31**	28**	.01	21*	-84* -28 04
		32 -42 19**	10	01	-02 -61** 24**	-13 -56** 31**
8.	Admits Own Mistakes; Laughs at Self or Uses Occasion to Teach or Motivate	00	78** -30 22**	01	07	04
		02	00	06	02	02

Table 3, Cont'd.

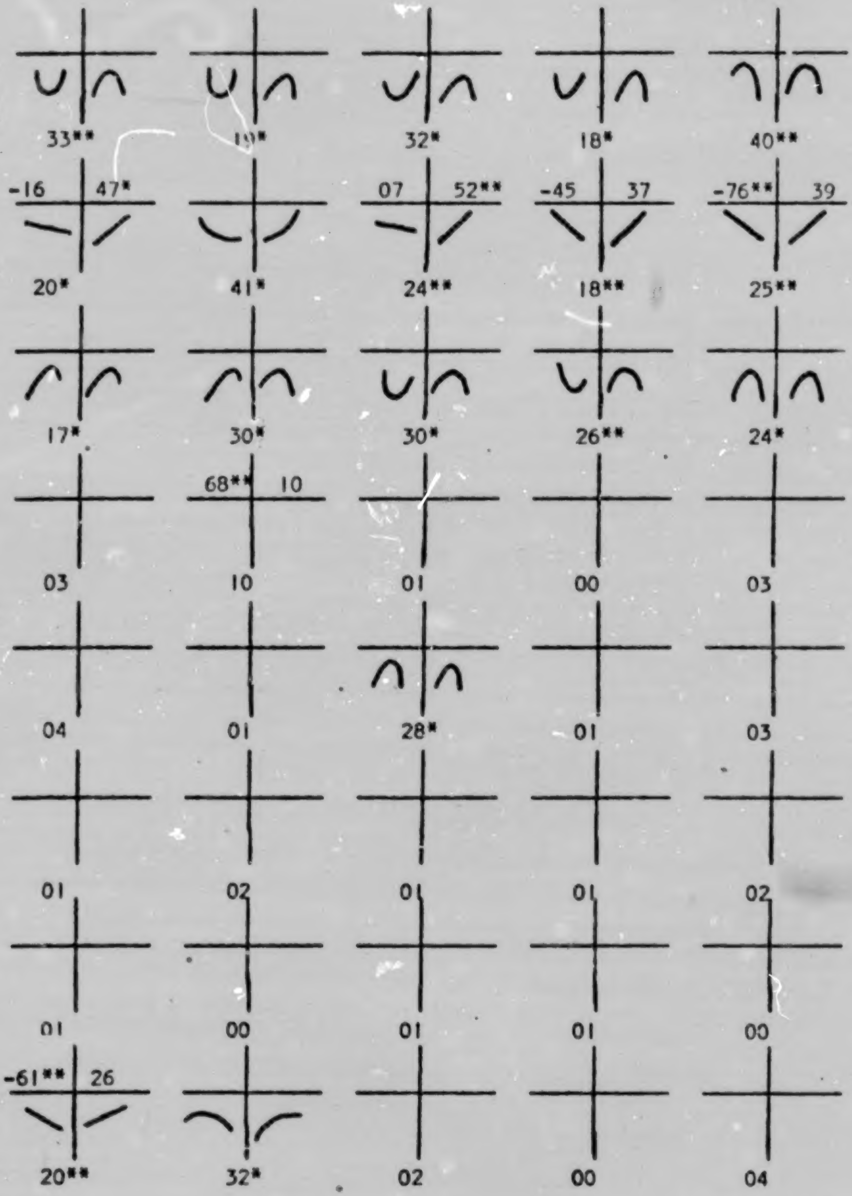
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
9.	Usually Bends Close, Gets Down to Child's Level	25 47* 14** 01	08 02	04 00	00 01	02 04
10.	Goes to Seats to Check Work; Doesn't Stay at Desk	00 -13 -54** 19**	01 ⌒ ⌣ 43**	16 00 -56** 21**	02 11 -52** ─ ╲ 18*	02 06
11.	Usually Speaks to Individuals rather than Whole Class	02 03	00 00	∪ ∩ 25* 03	02 00	00 00
12.	Uses Advance Organizers in Introducing Activities	09 00	04 01	01 00	∩ ∩ 18* 00	00 04

Table 3, Cont'd.



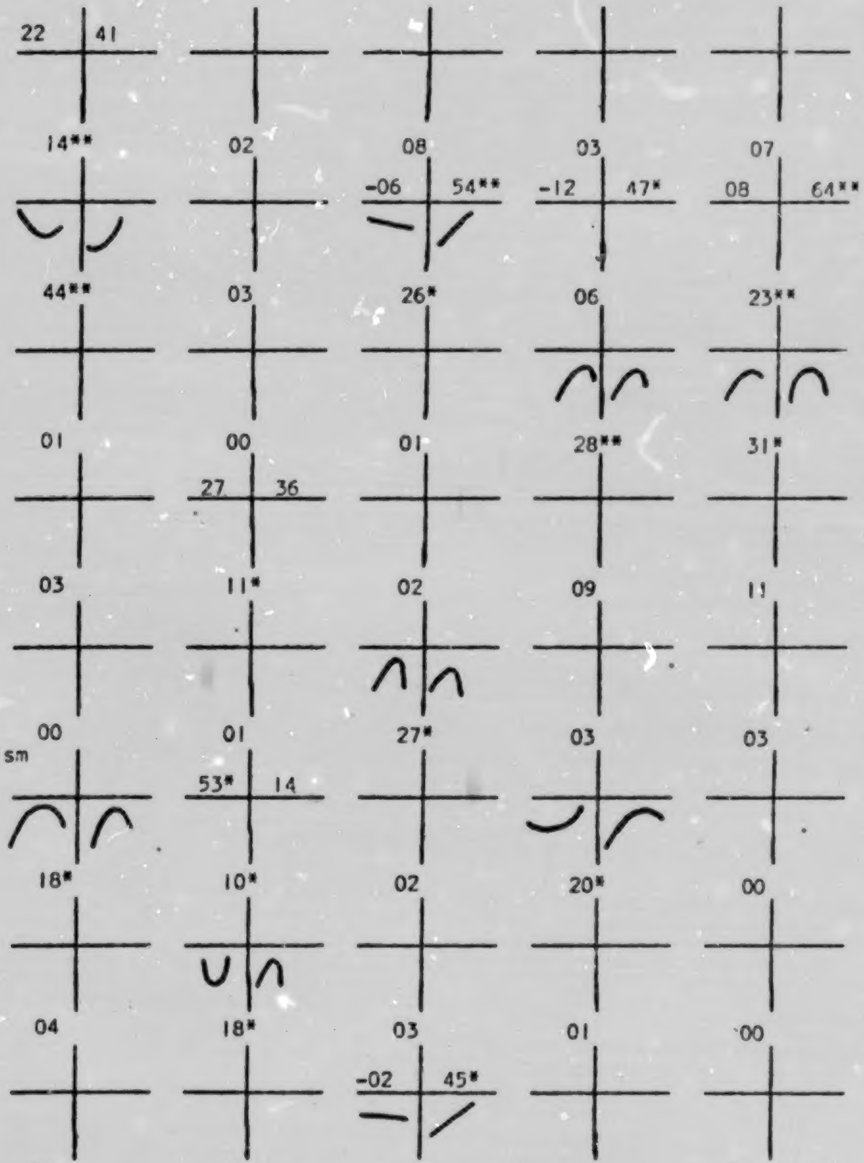
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
13.	Gives Complete, Detailed Instructions; Prevents Errors before They Happen	01 36 10*	04	01	41*	00
		01	00	03	01	06
14.	Students Eager to Respond; No Fear	03	06	07	04	00
		00	05	01	12 -42 13*	45 -51* 29**
15.	Teacher Waits Patiently If Student Doesn't Respond	02	44 -31 18*	00	02	02
		00	00	05	-32 -29 11*	-47 -43 17*
16.	Non-Competitive Atmosphere; No Signs of Eagerness to See Others Fail	01	23*	34**	45**	36**
		06	00	29**	30*	04

Table 3, Cont'd.



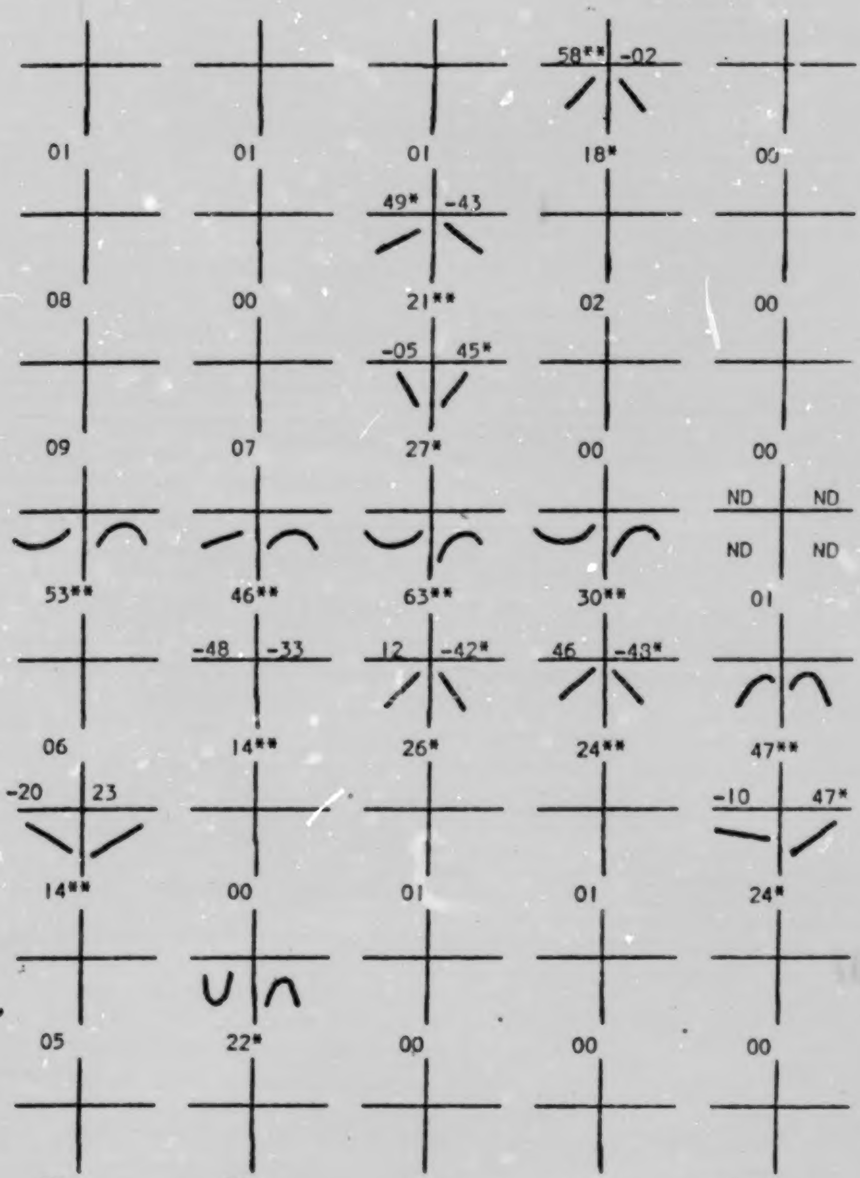
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
17.	Students Allowed to Work In Cooperative Groups	33** -16 47* 20*	19* 41*	32* 07 52** 24**	18* -45 37 18**	40** -76** 39 25**
18.	Teacher Recognized Good Thinking Even When It Doesn't Lead to "Right" Answers	17* 03	30* 68** 10 10	30* 01	26** 00	24* 03
19.	Democratic Leadership Style: Students Share In Planning and Decision Making	04 01	01 02	28* 01	01 01	03 02
20.	Few Restrictions on Students During Seatwork Periods	01 -61** 26 20**	00 32*	01 02	01 00	00 04

Table 3, Cont'd.



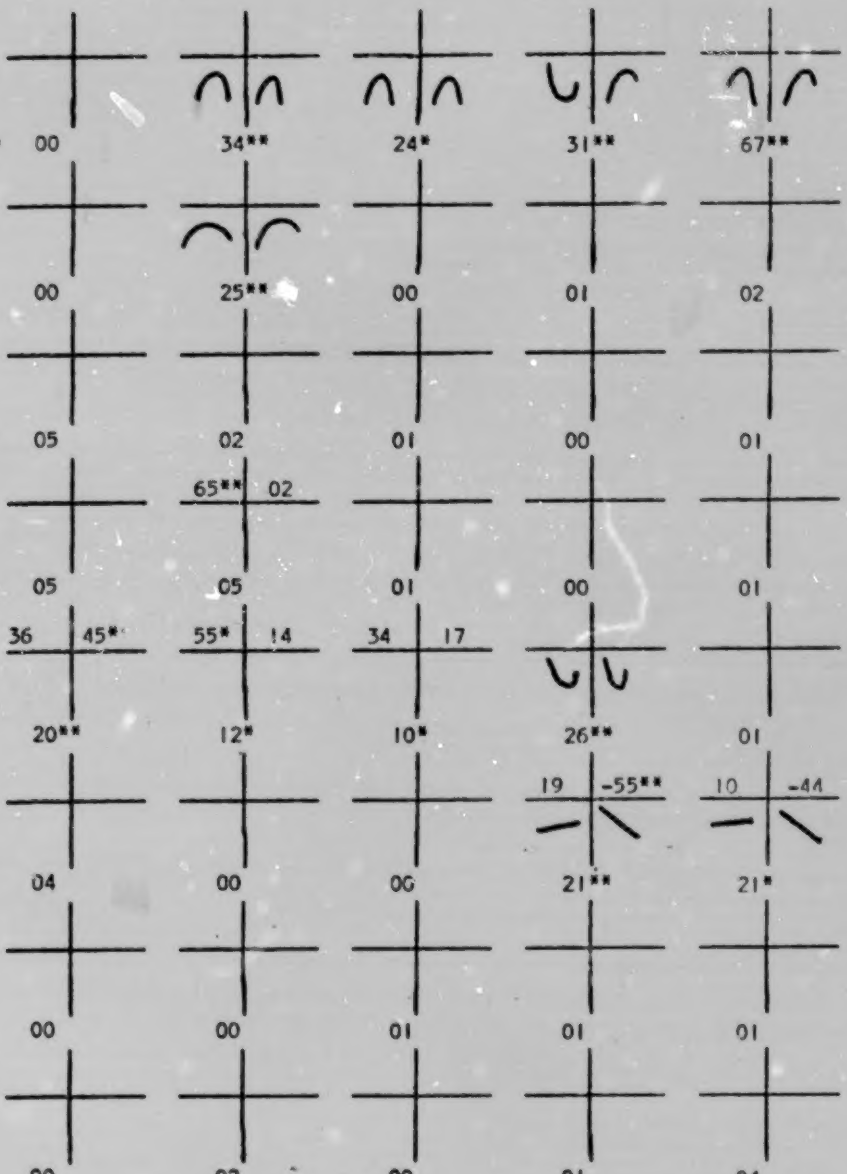
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
21.	Students Expected to Care for Needs without Getting Permission	22 41 14**	02	08	03	07
		44**	03	-06 54** 26*	-12 47* 06	08 64** 23**
22.	Teacher Concerned with Substantive Content, Not Form, or Student Responses	01	00	01	28**	31*
		03	27 36 11*	02	09	11
23.	Teacher Stresses Factual Realism, Rejects or Corrects Childish Idealism	00	01	27*	03	03
		18*	53* 14 10*	02	20*	00
24.	Teacher Credibility: Students Seem to Believe and Respect Teacher	04	18*	03	01	00
		06	03	-02 45* 19*	03	00

Table 3, Cont'd.



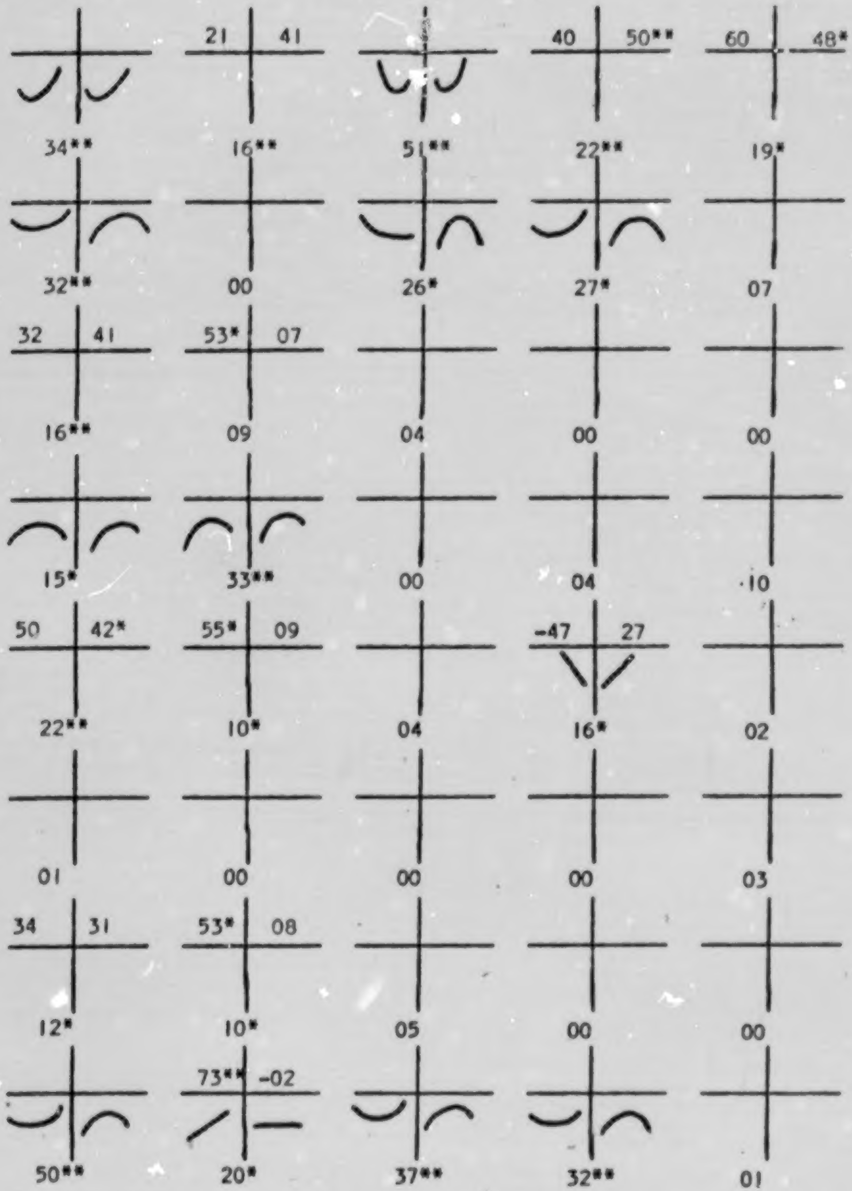
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
25.	Showmanship: Teacher Is Melodramatic, Expressive, Gushy, Emotive	01	01	01	58** -02 18*	00
		08	00	49* -43 21**	02	00
26.	Teacher Gets Attention before Starting, Doesn't Try to Talk over Din	09	07	-05 45* 27*	00	00
		53**	46**	63**	30**	ND ND ND ND 01
27.	Chaotic, Unplanned Poorly Scheduled	06	-48 -33 14**	12 -42* 26*	46 -43* 24**	47**
		-20 23 14**	00	01	01	-10 47* 24*
28.	Teacher Seems Confident, Self-Assured	05	22*	00	00	00
		07	04	04	01	00

Table 3 , Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
29.	Politeness: Teacher Regularly Says "Please," "Thank you," etc.	00	34**	24*	31**	67**
		00	25**	00	01	02
30.	High Concern About Achievement	05	02	01	00	01
		05	65** 02 05	01	00	01
31.	Room Is Attractive	36 45* 20**	55* 14 12*	34 17 10*	26**	01
		04	00	00	19 -55** 21**	10 -44 21*
32.	Teacher Gives Much Encouragement to Students	00	00	01	01	01
		00	02	00	01	04

Table 3, Cont'd.

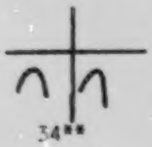
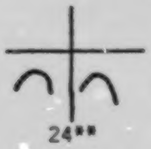
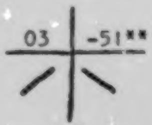
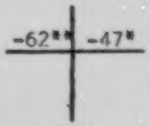
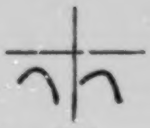
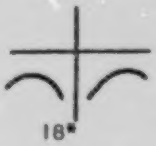
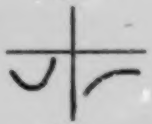
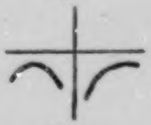
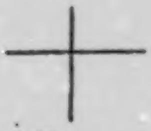
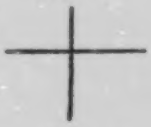
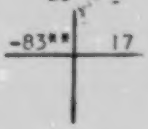
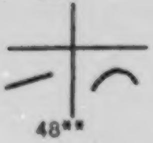
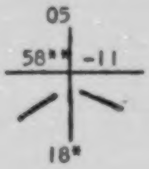
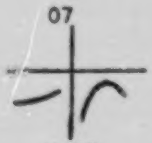
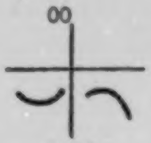
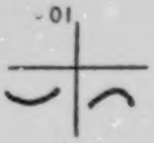


Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
33.	Room is Uncrowded	34**	21 41 16**	51**	40 50** 22**	60 48* 19*
		32**	00	26*	27*	07
34.	Teacher Explains Rules or Decisions When Reasons aren't Obvious	32 41 16**	53* 07 09	04	00	00
		15*	33**	00	04	10
35.	Teacher Well Organized, Prepared	50 42* 22**	55* 09 10*	04	-47 27 16*	02
		01	00	00	00	03
36.	Teacher Regularly Monitors Class, Knows What's Going On	34 31 12*	53* 08 10*	05	00	00
		50**	73** -02 20*	37**	32**	01

Table 3 , Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
37.	Smooth, Efficient Transitions, Little Time Wasted	50* 47* 24**	64** 15 13**	08 37 12*	02	02
		45* -14 00	42* -12 01	00	⌣ ⌢ 17*	08
38.	Monitors Determined "Automatically" by a Systematic Procedure	41 29 14**	56** 16 13**	41 44* 25**	07	03
		⌢ ⌢ 18*	01	01	01	02
39.	"Busy," Cluttered Classroom	00	00	01	-16 -43* 04	01
		01	-40 38 ╲ ╱ 18**	01	01	02
40.	Students Compliant, Obedient	07	05	05	01	-84** 20 01
		⌢ ⌢ 46**	00	⌣ ⌢ 56**	⌣ ⌢ 21**	⌣ ⌢ 32**

Table 3, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
41.	Teacher Gives Overly Explicit, Repetitive Directions	 34**	 24**	03 -51**  31*	-62** -47*  28**	 45**
		 18*	 03	 03	 17*	 30*
42,	Well Established Routines Minimize Interruptions; Room Runs "Automatically"	 08	 05	 07	 00	-83** 17  -01
		 48**	58** -11  18*	 44**	 30**	 35**

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[1] Probability values are indicated by asterisks. One asterisk indicates a value of ≤.10; two asterisks indicate a value of ≤.05.

Table 4. Non-linear Process-Product Relationships between Time Utilization Measures and Student Residual Gain Scores (averaged across four years) on the Metropolitan Achievement Tests (decimal points omitted).[1]

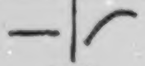
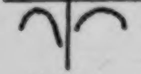
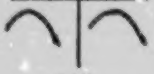
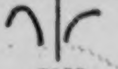
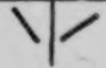
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
	Time Utilization					
1.	% Total Time Structured by Teacher	01	01	-10 -43* 09*	05	03
		01	01	01	01	 29**
2.	% Structured Time in Language Arts	-50* 14 00	01	00	00	03
		 29**	01	-31 -45 14*	-19 -75** 26**	 56*
3.	% Structured Time in Math	06	00	21 34 13**	 28**	06
		06	-37 -29 12*	01	03	00
4.	% Structured Time in Art	-04 39* 09*	01	-09 58**  33*	06	42 46* 20**
		02	01	25 30 12*	03	04

Table 4, Cont'd.

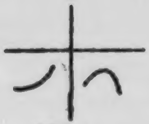
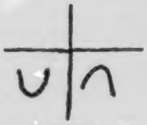
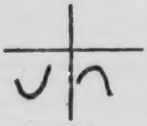
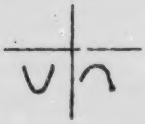
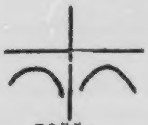
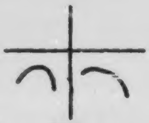
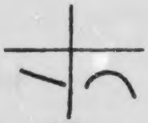
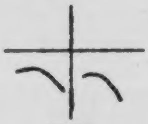
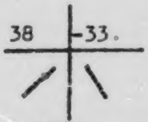
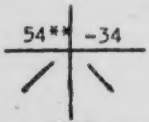
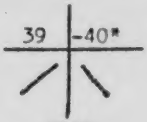
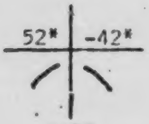
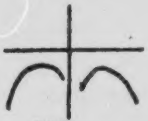
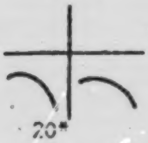
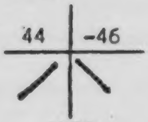
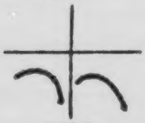
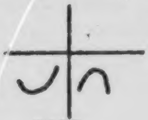
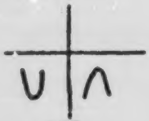
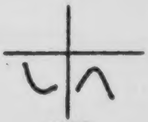
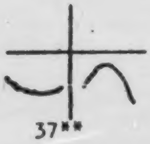
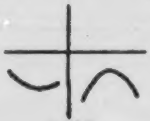
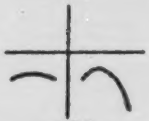
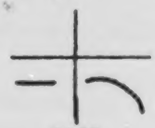
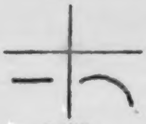
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
5.	% Structured Time in Spelling	 22*	01	 27**	 39**	 25*
		 30**	 25*	 30*	 33**	-84** -57* 20**
6.	% Structured Time in Reading Groups	38 -33  13*	54** -34  21**	39 -40*  22**	52* -42*  21**	39 -43* 11
		 20*	00	00	06	13
7.	% Structured Time in Social Studies	00	01	00	00	00
		 20*	01	00	44 -46  20**	 35**
8.	% Structured Time in Transitions	 35**	 18*	 43**	00	01
		 37**	 46**	 28**	 29**	 54**

Table 4 , Cont'd.

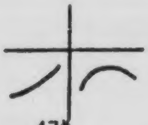
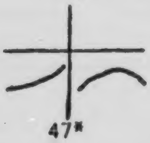
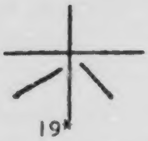
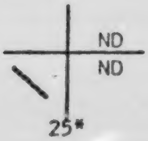
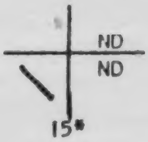
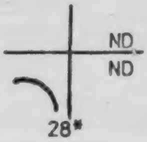
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
9.	% Structured Time In Morning Routine	01	02	00	00	03
		03	01	09	00	01
10.	% Structured Time In Special Activities	01	00	06	-59** -02 08	01
		 47*	10	 47*	00	03
11.	% Time Spent In Structured Seat-work					
		 19*	02	01	03	03
12.	% Time Spent In Free Choice Seat-work					
		01	00	 ND ND 25*	 ND ND 15*	 ND ND 28*

Table 4 , Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
13.	% Time Spent With Leader Other Than Teacher	ND ND ND ND 01	ND ND ND ND 01	ND ND ND ND 16	ND ND ND ND 01	ND ND ND ND 00

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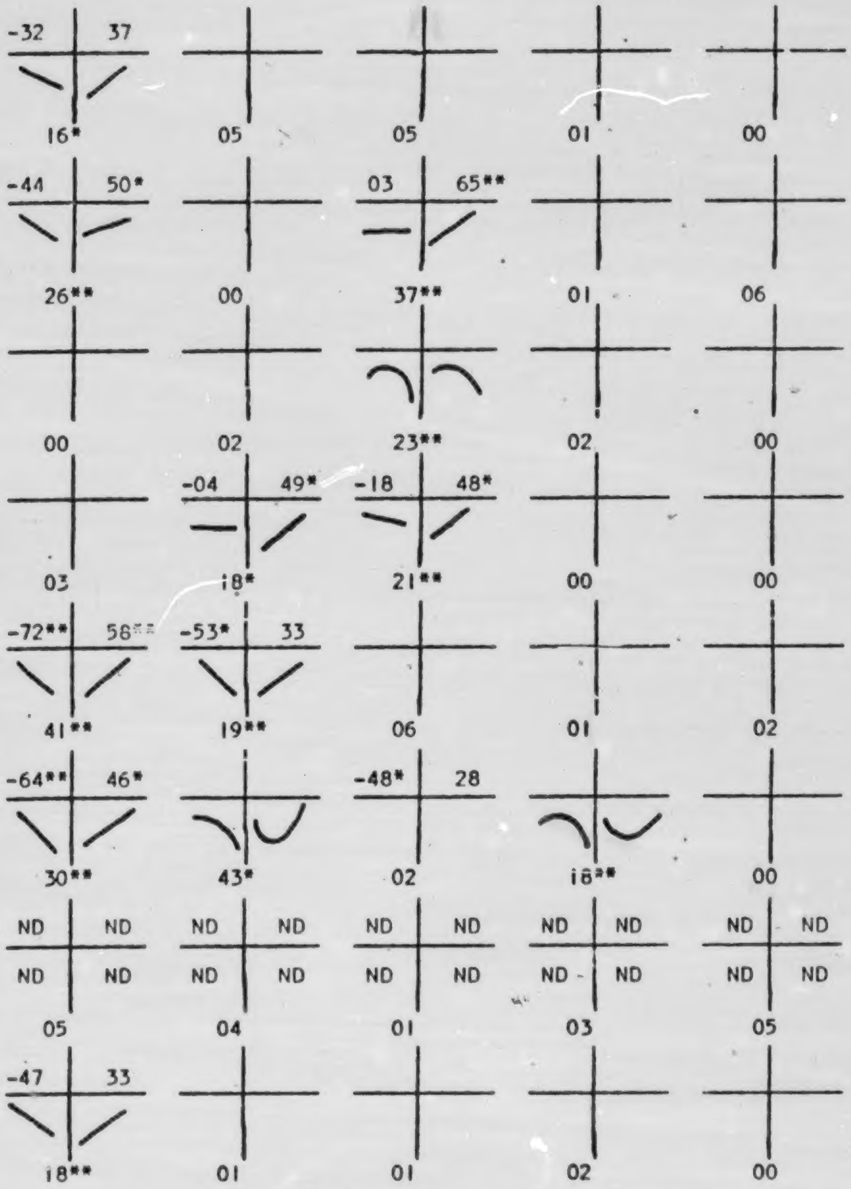
[1] Probability values are indicated by asterisks. One asterisk indicates a value of ≤.10; two asterisks indicate a value of ≤.05.

Table 5. Non-linear Process-Product Relationships between Lesson Presentation Variables and Student Residual Gain Scores (averaged across four years) on the Metropolitan Achievement Tests (decimal points omitted).[1]



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
1.	Uses Advance Organizers	-32, 37 16*	05	05	01	00
2.	Review of Old Material	-44, 50* 26**	00	03, 65** 37**	01	06
3.	Presentation of New Material	00	02	23**	02	00
4.	Practice of New Material	03	-04, 49* 18*	-18, 48* 21**	00	00
5.	Summarizing Review	-72**, 58** 41**	-53*, 33 19**	06	01	02
6.	Teacher-afforded Evaluation	-64**, 46* 30**	43*	-48*, 28 02	18**	00
7.	Elicited Student Self-evaluation	ND, ND ND, ND 05	ND, ND ND, ND 04	ND, ND ND, ND 01	ND, ND ND, ND 03	ND, ND ND, ND 05
8.	Instructions for Follow-up	-47, 33 18**	01	01	02	00

Table 5 , Cont'd.

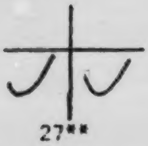
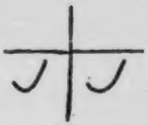
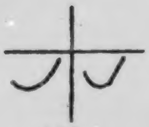
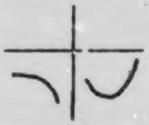
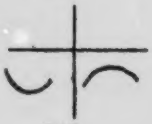
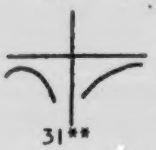
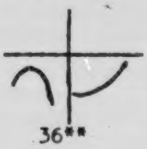
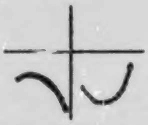
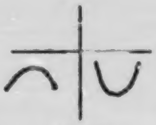
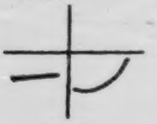
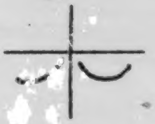
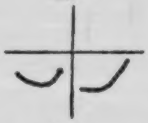
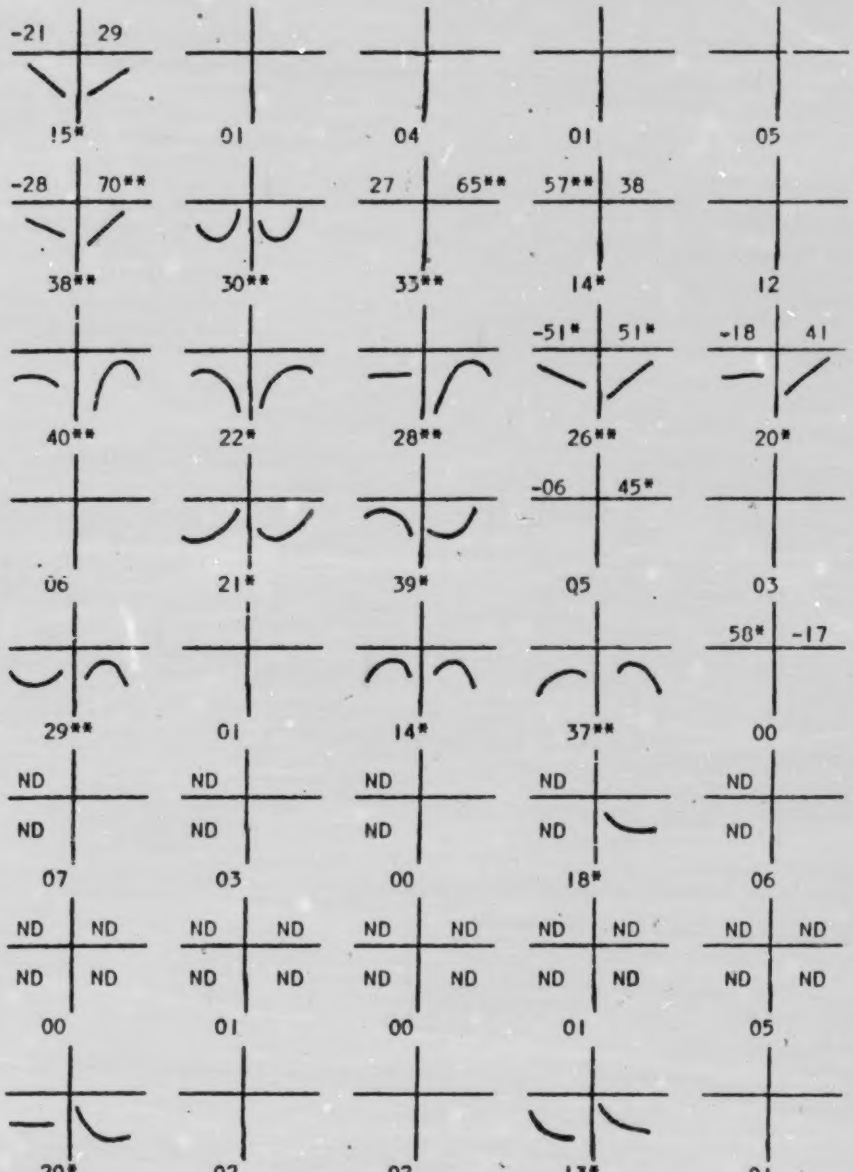
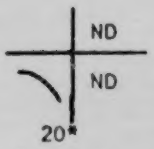
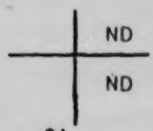
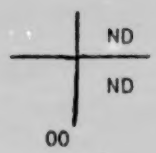
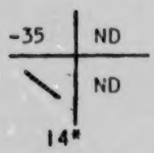
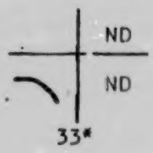
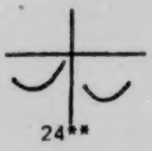
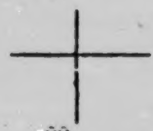
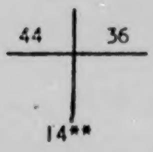
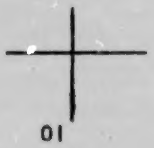
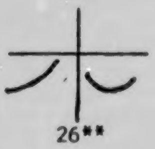
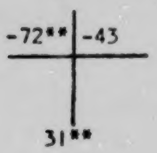
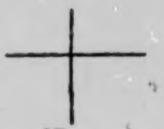
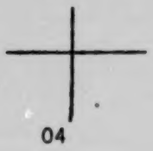
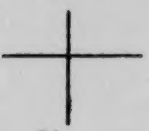
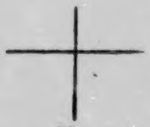
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
9.	Independent Activity	 27**	02	 14*	 14*	 41*
10.	Dead Spots	03	 24*	00	01	00
	Methods Categories					
11.	Lecture	03	04	01	07	05
12.	Demonstration	 31**	 36**	05	51* | 07 06	61* | 03 01
13.	Focused Discussion	-59** | 01 05	05	05	 26**	 25**
14.	Unfocused Discussion	01	01	 31**	 49**	 41*
15.	Silent Reading	00	01	05	09	67** | 16 06
16.	Oral Reading	06	00	00	05	01

Table 5, Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
17.	Drill	-21 29 15*	01	04	01	05
18.	Problem-solving	-28 70** 38**	30**	27 65** 33**	57** 38 14*	12
	Materials Categories					
19.	Standardized	40**	22*	28**	-51* 51* 26**	-18 41 20*
20.	Teacher Created	06	21*	39*	-06 45* 05	03
21.	A/V Aids	29**	01	14*	37**	58* -17 00
22.	Games/Activities	ND ND 07	ND ND 03	ND ND 00	ND ND 18*	ND ND 06
23.	Learning Centers	ND ND ND ND 00	ND ND ND ND 01	ND ND ND ND 00	ND ND ND ND 01	ND ND ND ND 05
	Degree of Individualation					
24.	Groups	20*	02	02	13*	01

Table 5 , Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
25.	Pairs	 20*	 01	 00	 14*	 33*
26.	individuals	 24**	 00	 14**	 01	 26**
27.	Uses non-patterned turns	 31**	 07	 04	 01	 00

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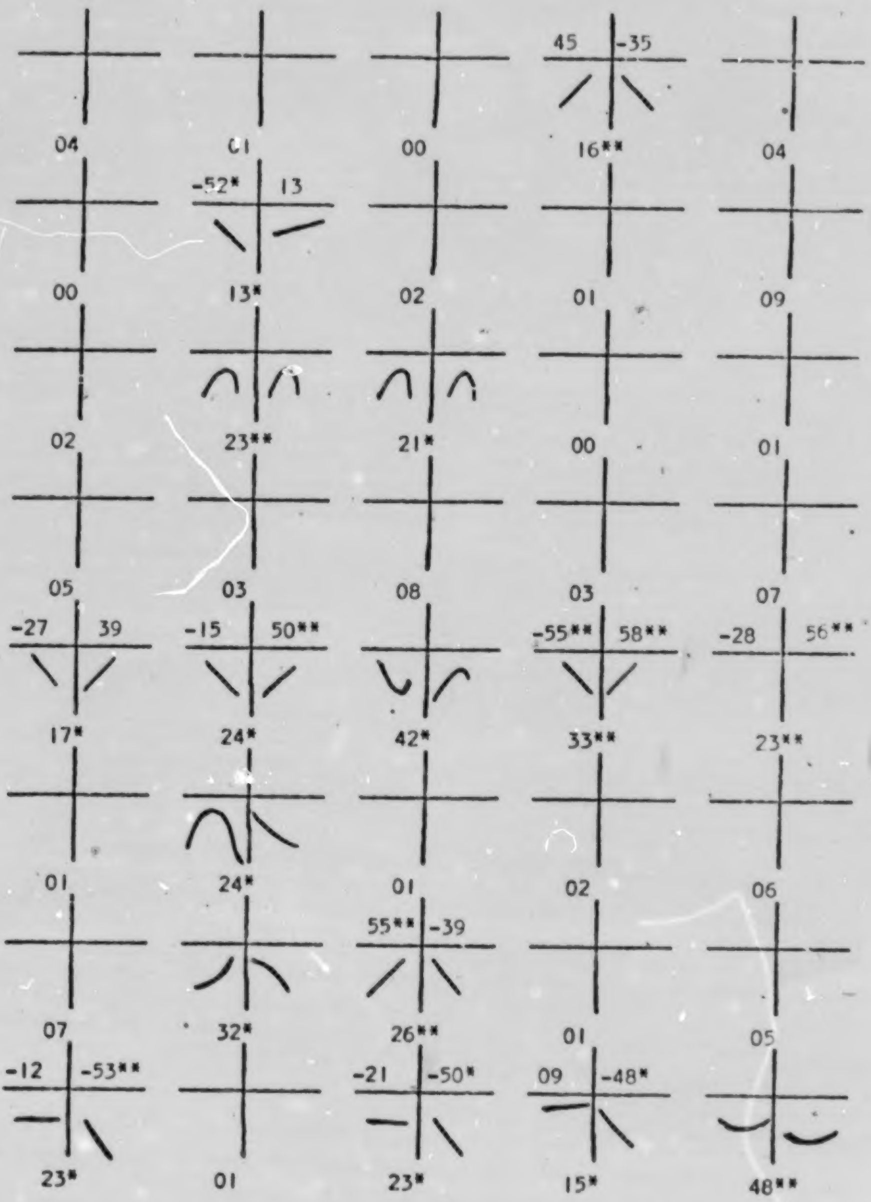
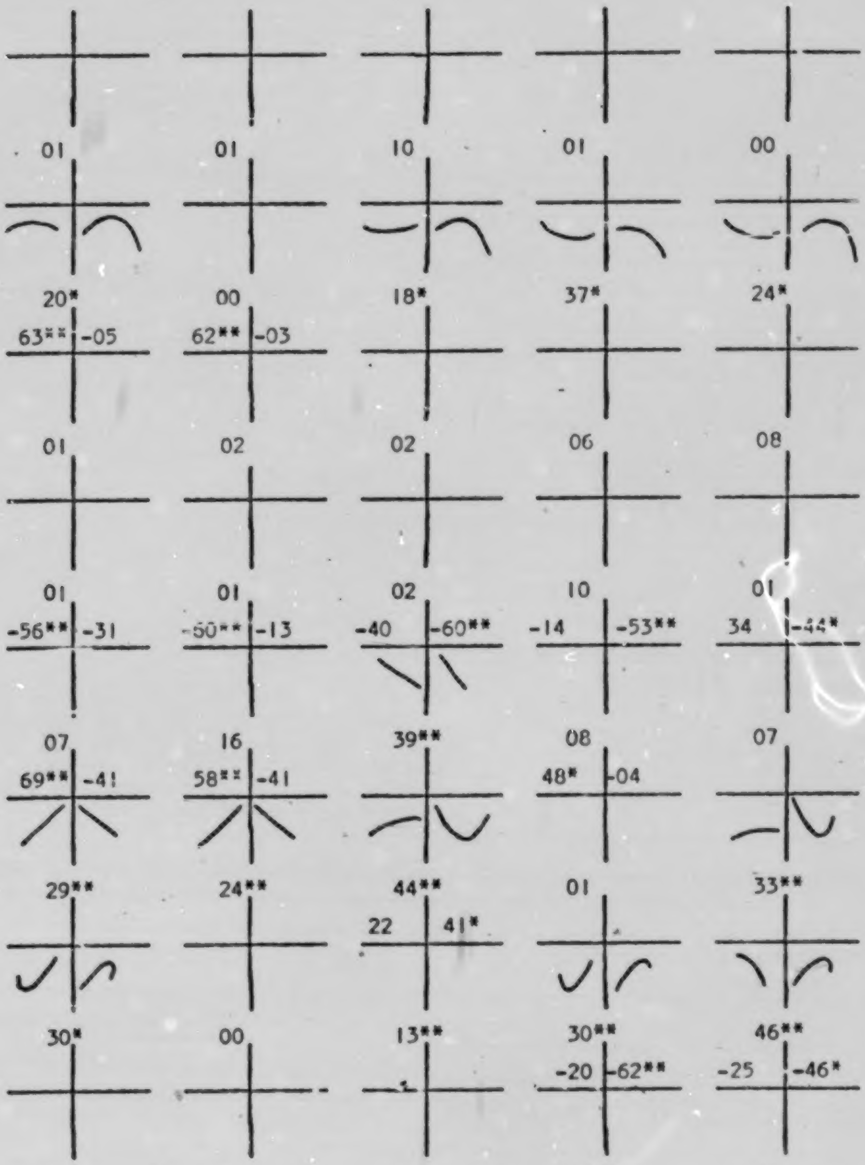
[1] Probability values are indicated by asterisks. One asterisk indicates a value of ≤.10; two asterisks indicate a value of ≤.05.

Table 6. Non-linear Relationships between Teacher Process Variables from the Expanded Brophy-Good Observational System (morning observations) and Student Residual Gain Scores (averaged across four years) on the Metropolitan Achievement Tests (decimal points omitted).[1]



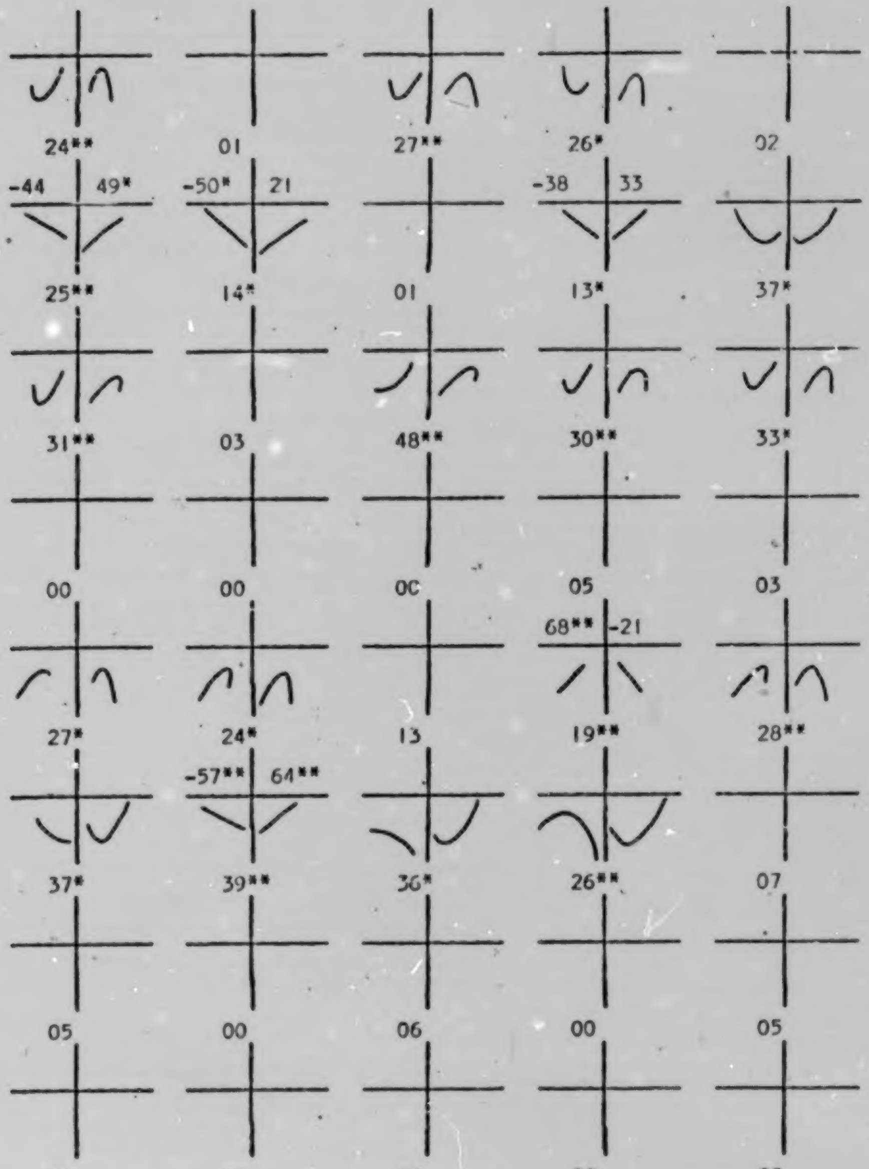
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
A.	Selecting Respondents to Questions					
1.	% Preselects Respondent before Asking Question	04	01	00	45 -35 16**	04
		00	-52* 13 13*	02	01	09
2.	Calls on Non-Volunteer	02	23**	21*	00	01
		05	03	08	03	07
3.	Calls on Volunteer	-27 39 17*	-15 50** 24*	42*	-55** 58** 33**	-28 56** 23**
		01	24*	01	02	06
4.	Student Calls Out Answers	07	32*	55** -39 26**	01	05
		-12 -53** 23*	01	-21 -50* 23*	09 -48* 15*	48**

Table 6, Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
B.	Difficulty Level of Questions	01	01	10	01	00
5.	Process Questions/ Process + Product Questions	20*	00	18*	37*	24*
		63** -05 01	62** -03 02	02	06	08
6.	Choice Questions/ Process + Product + Choice	01	01	02	10	01
C.	Quality of Children's Answers	-56** -31 07	-50** -13 16	-40 -60** 39**	-14 -53** 08	34 -44* 07
7.	% Correct	69** -41 29**	58** -41 24**	44**	48* -04 01	33**
		30*	00	22 41* 13**	30**	46**
8.	% Part-Correct	00	01	05	-20 -62** 16**	-25 -46* 11

Table 6, Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
9.	% Wrong	24**	01	27**	26*	02
		-44 49* 25**	-50* 21 14*	01	-38 33 13*	37*
10.	% "Don't Know"	31**	03	48**	30**	33*
		00	00	0C	05	03
11.	% No Response	27*	24*	13	68** -21 19**	28**
		37*	-57** 64** 39**	36*	26**	07
D.	Teacher Reactions to Correct Answers					
12.	Praise	05	00	06	00	05
		01	01	04	00	03

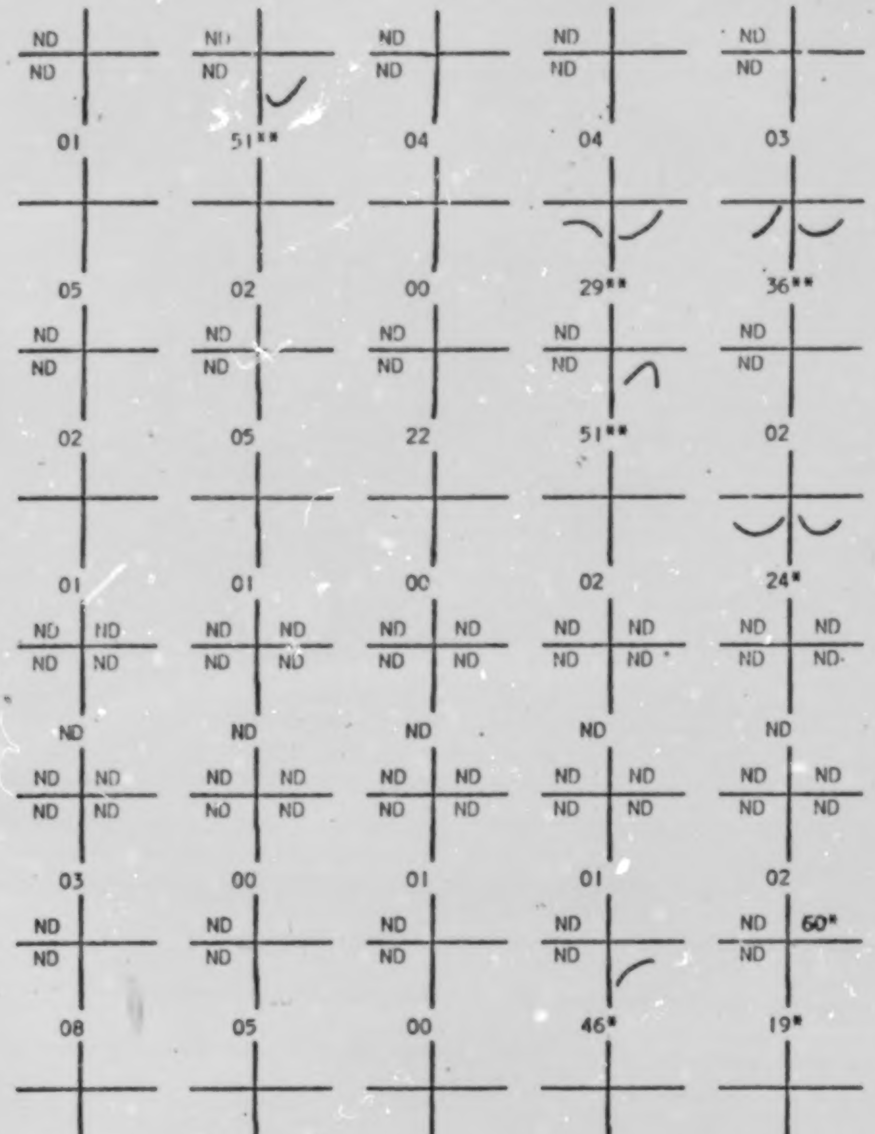
Table 6, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
13.	Criticism	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
14.	Failure to Give Feedback	00	∪ ∩ 31*	∪ ∩ 39**	√ ∩ 27**	╲ ∩ 31**
		05	01	01	00	00
15.	Process Feedback	ND ND ND ND 00	ND ND ND ND 02	ND ND ND ND 00	ND ND ND ND 01	ND ND ND ND 04
		-44 63** ╲ ╱ 36**	-24 48* 08	-31 56** ╲ ╱ 29*	03	10
16.	New Question	-58** 32 ╲ ╱ 17*	01	-49* -01 11	01	-79* 12 00
		52* 11 05	01	06	01	01

Table 6, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
16.	Teacher Reactions to Part-Correct Answers	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
17.	Praise	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
18.	Criticism	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
19.	Failure to Give Feedback	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
20.	Process Feedback	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 6, Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
21.	Gives the Answer	ND ND 01	ND ND 51**	ND ND 04	ND ND 04	ND ND 03
		05	02	00	29**	36**
22.	Calls on Someone Else	ND ND 02	ND ND 05	ND ND 22	ND ND 51**	ND ND 02
		01	01	00	02	24*
23.	Another Student Calls Out the Answer	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND 03	ND ND ND ND 00	ND ND ND ND 01	ND ND ND ND 01	ND ND ND ND 02
24.	Repeats, Rephrases, or Asks New Question	ND ND 08	ND ND 05	ND ND 00	ND ND 46*	ND 60* ND 19*
		02	01	00	01	00

Table 6 , Cont'd.

Number	Process Variable	Word Knowledge		Word Discrimination		Reading		Arithmetic Computation		Arithmetic Reasoning	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
25.	Repeats Question	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		01		02		10		06		00	
		ND		ND		ND		ND		ND	
		ND		ND	⌒	ND		ND		ND	
		00		37**		00		00		01	
		ND	50*	ND		ND		ND		ND	
26.	Rephrases or Gives Clue	ND		ND	⌒	ND	⌒	ND		ND	⌒
		19**		41*		43*		06		50*	
		65**	06								
		12*		09		01		00		02	
		ND		ND		ND		ND		ND	
27.	Asks New Question	ND		ND		ND	⌒	ND	⌒	ND	
		04		03		41*		46**		10	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		07		03		03		00		00	
F.	Teacher Reactions to Wrong Answers	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
28.	Praise	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	

Table 6 , Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
29.	Criticism	ND │ ND ND │ ND ND	ND │ ND ND │ ND ND	ND │ ND ND │ ND ND	ND │ ND ND │ ND ND	ND │ ND ND │ ND ND
		ND │ ND ND │ ND 00	ND │ ND ND │ ND 01	ND │ ND ND │ ND 06	ND │ ND ND │ ND 02	ND │ ND ND │ ND 12
30.	Failure to Give Feedback	ND │ ND ND │ ND ND	ND │ ND ND │ ND ND	ND │ ND ND │ ND ND	ND │ ND ND │ ND ND	ND │ ND ND │ ND ND
		-46 │ ND ╲ │ ND 30**	-33 │ ND ╲ │ ND 17*	-19 │ ND ╲ │ ND 29**	│ ND │ ND 01	00 │ ND — │ ND 23**
31.	Process Feedback	ND │ ND ND │ ND 04	ND │ ND ND │ ND 05	ND │ ND ND │ ND 01	ND │ ND ND │ ND 03	ND │ ND ND │ ND 01
		-09 │ -44* │ 10	│ │ 00	│ │ 02	│ │ 00	│ │ 03
32.	Gives the Answer	ND │ ND │ ╭ 36**	ND │ ND │ ╭ 39**	ND │ 27 ND │ 27**	ND │ 34 ND │ 12*	ND │ ND │ .07
		-18 │ -40 │ 12*	│ │ 04	-23 │ -51** │ 18**	36 │ -51** ╱ │ ╲ 22**	│ │ 09

Table 6, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
33.	Calls on Someone Else	01	05	-64** 20 \ / 27*	00	ND ND 03
		03	04	01	-55** 01 05	-72** 06 01
34.	Another Student Calls Out the Answer	ND ND ND ND 04	ND ND ND ND 07	ND ND ND ND 04	ND ND ND ND 00	ND ND ND ND 05
		ND ND 02	ND ND 00	ND ND 09	ND ND 01	ND ND 02
35.	Repeats, Rephrases or Asks New Question	01	54* -03 01	44 -24 17**	00	ND ND 01
		03	00	10	34 37 13*	62* 29 12
36.	Repeats Question	∩ ∩ 43**	00	04	-17 -53** 11*	ND ND ∩ 46*
		02	01	03	02	04

Table 6, Cont'd.

Number	Process Variable	Word Knowledge		Word Discrimination		Reading		Arithmetic Computation		Arithmetic Reasoning	
		ND		ND		ND		ND		ND	
		ND		ND		ND		ND		ND	
37.	Rephrases or Gives Clue	09		03		18		04		05	
										63*	15
		00		02		04		08		07	
			ND		ND		ND		ND	ND	ND
			ND		ND		ND	✓	ND	ND	ND
38.	Asks New Question	00		00		17		24*		00	
										31	54**
		34**		21**		06		07		30**	
G.	Teacher Reactions to "I Don't Know" or No Response										
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
39.	Criticism	ND		ND		ND		ND		ND	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
40.	Failure to Give Feedback	ND		ND		ND		ND		ND	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	

Table 6, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
41.	Gives the Answer	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND
		ND	ND	ND	ND	ND
		ND ND	ND ND	ND ND	ND ND	ND ND
		00	02	02	27**	01
42.	Calls on Someone Else					
		03	00	06	03	00
		04	06	20**	01	00
43.	Another Student Calls Out the Answer	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND
		20**	05	19**	25**	35**
		-08 -75**		-20 -73**	03 -83**	
		44**	02	49**	44**	58*
44.	Repeats, Rephrases, or Asks New Question					
		44**	16	01	00	06
		01	.06	03	05	09

Table 6 , Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
45.	Repeats Question	07 49* / / 24*	∩ ∩ 22*	02	01	08
		02	-45 -39 13*	01	01	04
46.	Rephrases or Gives Clue	ND ND ND ND 06	ND ND ND ND 04	ND ND ND ND 04	ND ND ND ND 00	ND ND ND ND 01
		00	01	04	03	65* 24 06
47.	Asks New Question	ND ND ND ND 00	ND ND ND ND 00	ND ND ND ND 01	ND ND ND ND 01	ND ND ND ND 11
		00	-49 25 \ — 14*	08	03	00
H.	Teacher Reaction to DK					
48.	Criticism	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 6, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
49.	Failure to Give Feedback	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
50.	Gives the Answer	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
51.	Calls on Someone Else	ND ND 01	ND 67* ND 31**	ND ND 03	ND ND 18	ND ND 15
52.	Another Student Calls Out the Answer	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 6, Cont'd.

Number	Process Variable	Word Knowledge		Word Discrimination		Reading		Arithmetic Computation		Arithmetic Reasoning	
53.	Repeats, Rephrases or Asks New Question	ND		ND	-70*	ND		ND	-80**	ND	-71*
		ND		ND		ND		ND		ND	
		00		24*		02		16		31**	
54.	Repeats Question	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
55.	Rephrases or Gives Clue	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
56.	Asks New Question	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	

Table 6, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
1.	Teacher Reaction to No Response					
57.	Criticism	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
58.	Failure to Give Feedback	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
59.	Gives the Answer	ND ND 00	ND ND 01	ND ND 03	ND ND 26**	ND ND 01
60.	Calls on Someone Else	04	04	20**	04	01

Table 6, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
61.	Another Student Calls Out the Answer					
		-10 ND — ND	ND ND	-17 ND — ND	07 ND — ND	24 ND — ND
		44**	03	49**	45**	51**
62.	Repeats, Rephrases or Asks New Question					
		01	04	04	08	13
63.	Repeats Question					
		01	09	01	02	06
64.	Rephrases or Gives Clue					
					51* 12	68* 27
		00	01	05	04	07

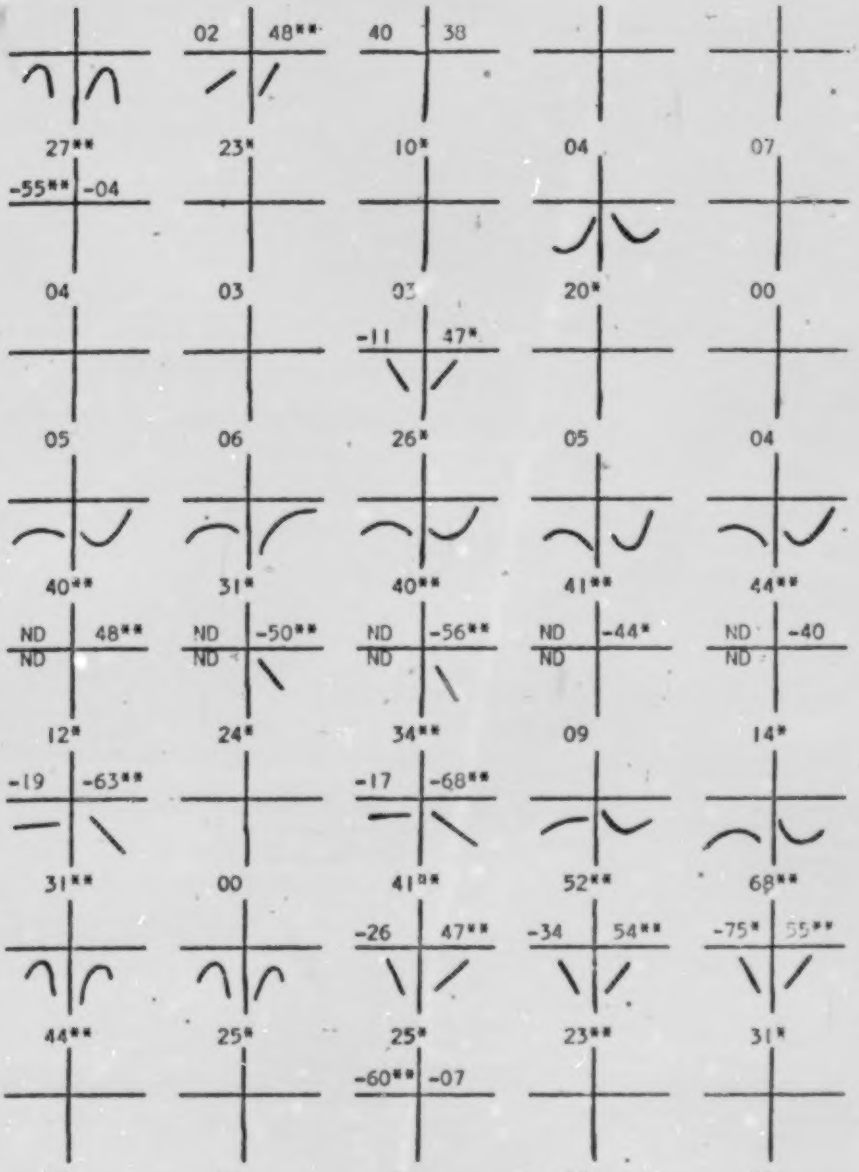
Table 6, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
65.	Asks New Question					
		ND ND	ND -23 ND	ND ND	ND ND	ND ND
J.	Teacher Reactions Combined Across All Response Opportunities	00	14*	07	02	00
66.	Praise					
		02	01	02	00	02
		01	20**	03	00	02
66B.	Criticism After All Incorrect Answers					
		-51* 27	-69** 26			22 46*
		17*	23**	05	03	14*
67.	Failure to Give Feedback					
		00	26**	25**	00	30**
		01	00	01	17*	01

Table 6, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
68.	Process Feedback	-19 ND ╲ ND 19**	ND ND 02	08 ND ╱ ND 31**	-27 ND ╲ ND 11*	-32 ND ╲ ND 24*
		-18 44* ╲ ╱ 18*	09	06	03	∪ ∪ 29*
69.	New Question	-59** 26 ╲ ╱ 14*	01	01	03	-83** 05 00
		49* 09 04	01	06	02	02
70.	Repeat, Rephrase or Asks New Question After Failure to Answer	37 52** 22**	54* 28 13**	∪ ∩ 43*	∨ ∩ 29**	-34 45* 13
		01	01	05	05	07
71.	Repeats Question After Failure to Answer Correctly	∨ ∩ 27**	∨ ∩ 25*	00	00	00
		-33 42 ╲ ╱ 19**	-48* 22 01	╲ ╱ 42*	00	10

Table 6, Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
72.	Gives the Answer After Failure to Answer Correctly	27**	02 48** 23*	40 38 10*	04	07
		-55** -04 04	03	03	20*	00
73.	Calls on Another Student After Failure to Answer Correctly	05	06	-11 47* 26*	05	04
		40**	31*	40**	41**	44**
74.	Another Student Calls Out Answer After Failure to Answer Correctly	ND 48** ND 12*	ND -50** ND 24*	ND -56** ND 34**	ND -44* ND 09	ND -40 ND 14*
		-19 -63** 31**	00	-17 -68** 41**	52**	68**
K.	Student Response Opportunities					
75.	Response Opportunities/ Total Teaching Time	44**	25*	-26 47** 25*	-34 54** 23**	-75* 55** 31*
		02	01	-60** -07 03	04	02

Table 6 , Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
L.	Student Initiated Questions (SIQ's)	ND ND	ND ND	ND ND	ND ND	ND ND
76.	% SIQ's Irrelevant	00	00	00	05	01
		ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND
		ND	ND	ND	ND	ND
77.	% SIQ's Called Out	ND ND	ND ND	ND ND	ND ND	ND ND
		01	00	00	00	03
		ND ND	ND ND	ND ND	ND ND	ND ND
		01	03	01	05	02
		ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND
78.	Praise of Question after Relevant SIQ's	ND	ND	ND	ND	ND
		ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND
		ND	ND	ND	ND	ND
		ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND
79.	Criticism of Question after Relevant SIQ's	ND	ND	ND	ND	ND
		ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND
		ND	ND	ND	ND	ND

Table 6 , Cont'd.

Number	Process Variable	Word Knowledge		Word Discrimination		Reading		Arithmetic Computation		Arithmetic Reasoning	
80.	% Relevant SIQ's Given No Feedback	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
81.	% Relevant SIQ's Delayed	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		06		05		04		00		05	
82.	% Relevant SIQ's Not Accepted	ND	ND	ND	ND		ND	ND		ND	
		ND	ND	ND	ND		ND	ND		ND	
		ND		ND		ND		ND		ND	
		-24	41*								
		08		25*		00		06		12	
83.	% Relevant SIQ's Given Brief Feedback					-59*	05	68**	24	83**	-14
		01		00		02		18**		01	

Table 6, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
84.	% Relevant SIQ's Given Long Feedback	ND -56** ND 32**	ND -44* ND 06	ND ND 02	ND ND 03	ND -45* ND 09
		00	00	-61** -03 02	-58* -04 07	-76** 36 24*
85.	% Relevant SIQ's Redirected to Class	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
86.	Behavioral Praise of Relevant SIQ's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
87.	Behavioral Criticism of Relevant SIQ's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 6, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
88.	Behavioral Warning after Relevant SIQ's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
89.	Criticism of Question after Irrelevant SIQ's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
90.	% Irrelevant SIQ's Given No Feedback	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
91.	% Irrelevant SIQ's Delayed	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 6 , Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
92.	% Irrelevant SIQ's Given Brief Feedback	ND ND ND ND 19	ND ND ND ND 30	ND ND ND ND 13	ND ND ND ND 04	ND ND ND ND 09
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
93.	% Irrelevant SIQ's Given Long Feedback	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND NC ND	ND ND ND ND ND	ND ND ND ND ND
94.	% Irrelevant SIQ's Not Accepted	ND ND ND ND 19	ND ND ND ND 00	ND ND ND ND 07	ND ND ND ND 13	ND ND ND ND 18
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
95.	% Irrelevant SIQ's Redirected to Class	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 6 , Cont'd.

Number	Process Variable	Word Knowledge		Word Discrimination		Reading		Arithmetic Computation		Arithmetic Reasoning	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
96.	Behavior Criticism after Irrelevant SIQ's	ND		ND		ND		ND		ND	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
97.	Behavioral Warning after Irrelevant SIQ's	ND		ND		ND		ND		ND	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
M.	Student Initiated Public Interactions	-07	-49**			04	-39*	23	-47**		
98.	Student Initiated Comments and Questions/ Total Response Opportunities	12**		02		14		16*		05	
						37	-44	33	-47*		
		07		00		19*		18**		01	
N.	Student Initiated Comments (SIC's)	69**	-19			70**	04	69**	-09	74*	-22
99.	% SIC's Relevant	00		00		04		16*		05	
		-40	48*			-38	46*	01	66**	18	79**
		24**		02		20**		27**		57**	

Table 6, Cont'd.

Number	Process Variable	Word Knowledge		Word Discrimination		Reading		Arithmetic Computation		Arithmet Reasoni	
100.	% SIC's Called Out	ND		ND		ND		ND		ND	51**
		ND		ND		ND	✓	ND	✓	ND	
		02		03		31*		23*		14*	
						-53*	-19	-28	-45		
		01		00		07		11*		06	
101.	Praise of Comment after Relevant SIC's	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
102.	% Relevant SIC's Given No Feedback	ND		ND		ND		ND		ND	
		ND		ND		ND		ND		ND	
		04		06		06		02		11	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		04		06		06		02		12	
103.	% Relevant SIC's Delayed	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	

Table 6, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
104.	% Relevant SIC's Not Accepted	ND ND 21*	ND ND 31**	ND ND 00	ND -47** ND 27**	ND ND 32**
		05	03	-18 44 17*	00	31*
105.	% Relevant SIC's Accepted	71** -02 01	00	00	29**	93** 12 04
		01	00	00	01	00
106.	% Relevant SIC's Integrated into Discussion Topic	ND 08 ND 04	ND ND 02	ND ND 00	ND 24 ND 23**	ND 22 ND 01
		22*	05	23**	23**	45**
107.	% Relevant SIC's Which Cause a Shift in Topic	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 6, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
108.	Behavioral Praise after Relevant SIC's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
109.	Behavioral Criticism after Relevant SIC's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
110.	Behavioral Warning after Relevant SIC's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
111.	Praise of Comment after Irrelevant SIC's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 6 , Cont'd.

Number	Process Variable	Word Knowledge		Word Discrimination		Reading		Arithmetic Computation		Arithmetic Reasoning	
112.	% Irrelevant SIC's Given No Feedback	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
113.	% Irrelevant SIC's Delayed	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
114.	% Irrelevant SIC's Not Accepted	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
115.	% Irrelevant SIC's Accepted	ND		ND		ND		ND		ND	
		ND		ND		ND		ND	✓	ND	
		04		01		01		29**		00	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	

Table 6 , Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
116.	% Irrelevant SIC's Integrated Into Discussion Topic	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
117.	% Irrelevant SIC's Which Cause a Shift In Topic	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
118.	Behavioral Praise after Irrelevant SIC's					
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
119.	Behavioral Criticism after Irrelevant SIC's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 6, Cont'd.

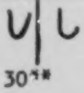
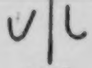
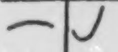
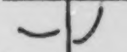
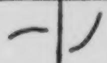
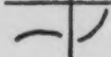
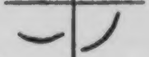
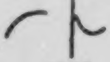
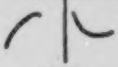
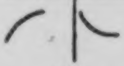
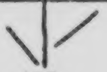
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
120.	Behavioral Warning after Irrelevant SIC's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	[illegible] ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
0.	Self and Opinion Questions					
121.	Self Questions/Process + Product + Choice Questions	-22 -43* 14**	04	-34 -39 13**	 30**	 38**
		 26**	 21*	 24**	 25*	 42**
122.	% Self Questions Which Were Subject-Matter Related	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		00	00	 55**	 45**	 43*
123.	% Self Questions Related to Personal Preference	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		00	-32 44  17*	01	00	00

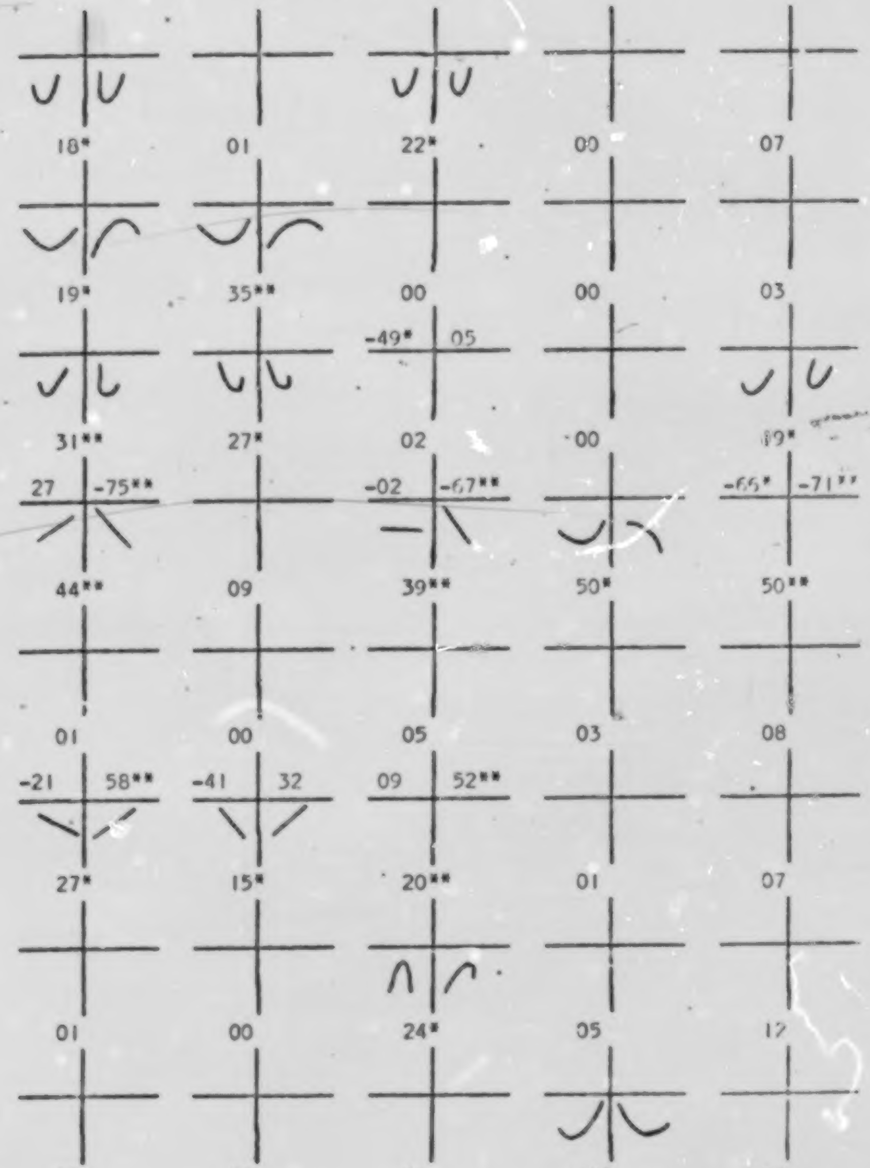
Table 6, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
124.	Opinion Questions/ Process + Product + Choice Questions	ND ND 07	ND ND 28*	ND ND 10	ND ND 00	ND ND 01
		02	20*	00	47 -39 18**	46 -39 20*
125.	% Opinion Questions Given No Response	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
126.	% Opinion Questions Followed by Praise	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
127.	% Opinion Questions Criticized					
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 6, Cont'd.

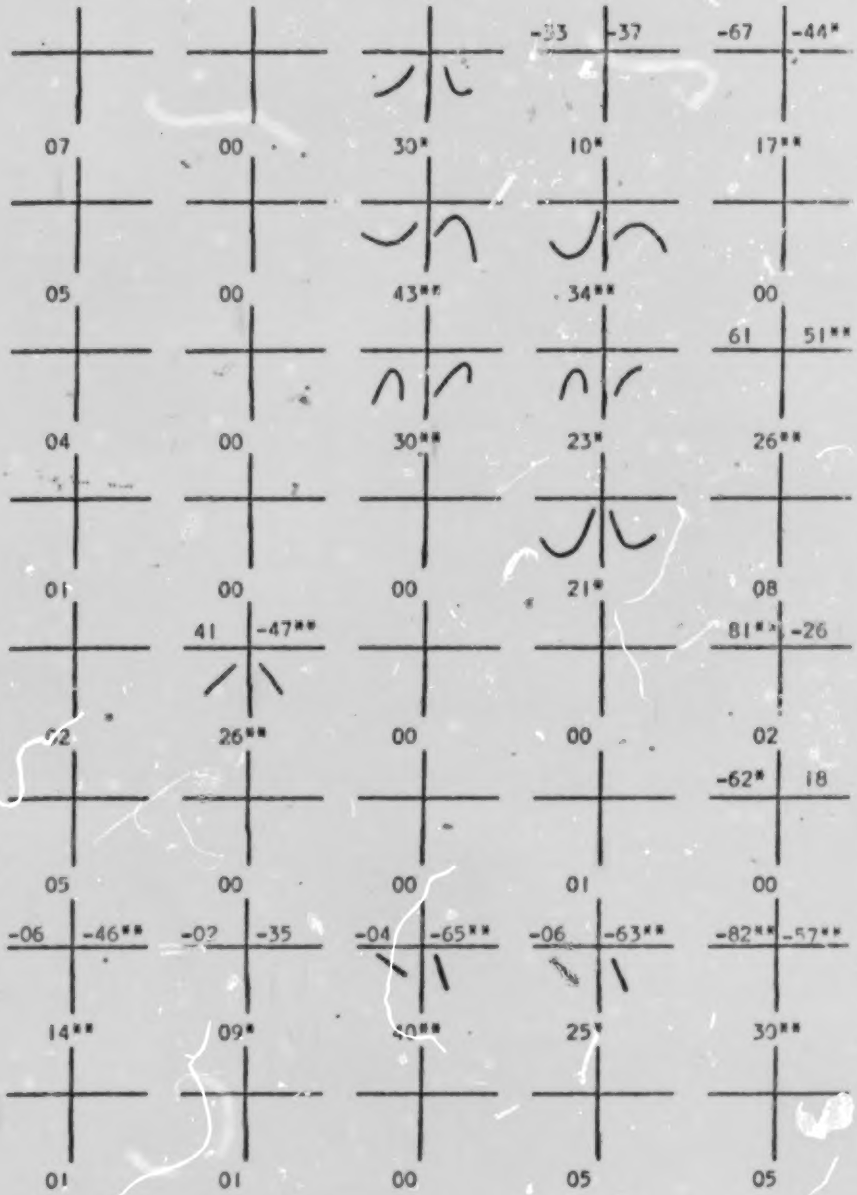
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
128.	% Opinion Questions Given No Feedback					
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
129.	% Opinion Questions Followed by Teacher Disagreement	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND 01	ND ND 07	ND ND 01	ND ND 01	ND ND 01
130.	% Student Opinions Accepted	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		04	00	04	01	00
131.	% Student Opinions Integrated Into Discussion Topic	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 6 , Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
P.	Private Dyadic Contacts					
132.	% Private Contacts Student Initiated	18*	01	22*	00	07
		19*	35**	00	00	03
133.	Student Initiated Work Contacts Involving Praise	31**	27*	-49* 05 02	00	19*
		27 -75** 44**	09	-02 -67** 39**	50*	-66* -71** 50**
134.	Student Initiated Work Contacts Involving Criticism	01	00	05	03	08
		-21 58** 27*	-41 32 15*	09 52** 20**	01	07
135.	% Private Work Contacts Student Initiated	01	00	24*	05	12
		05	00	00	16*	04

Table 6, Cont'd.

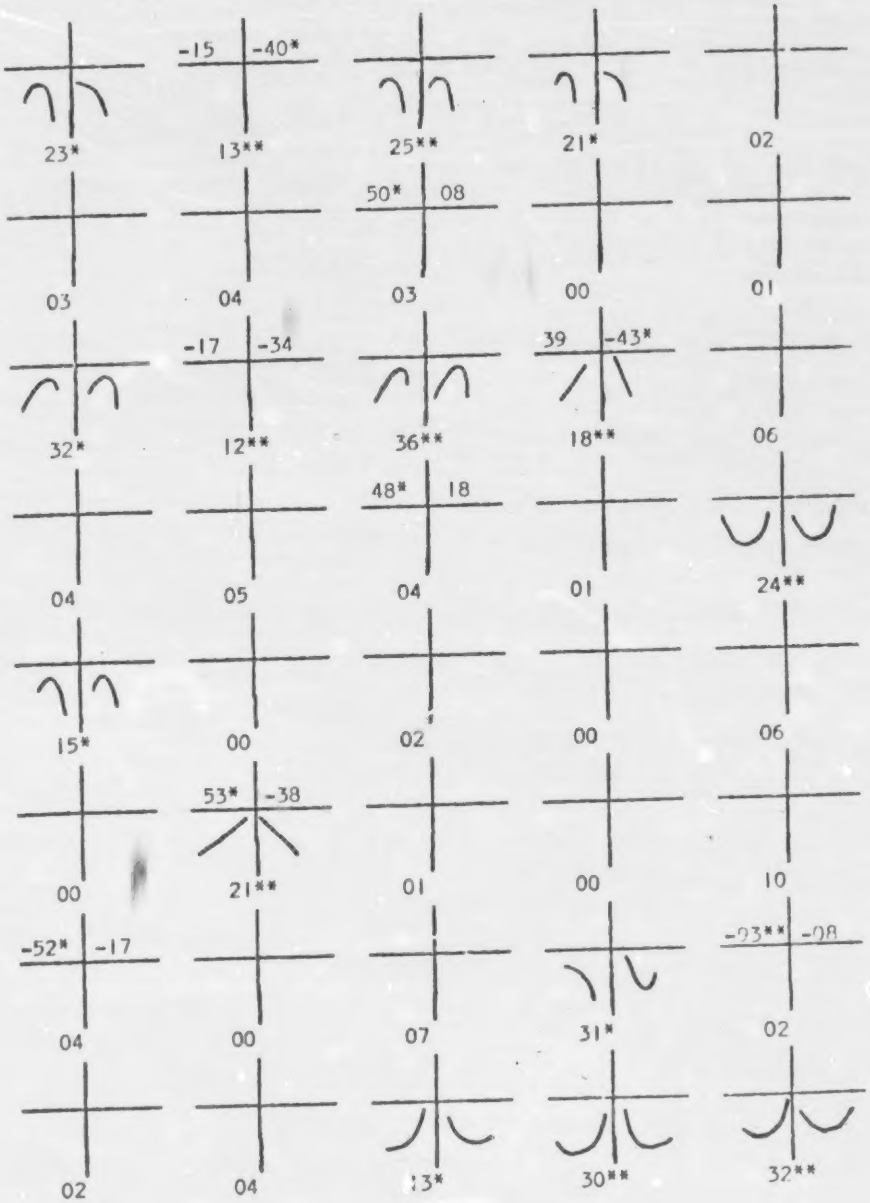


Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
136.	% Student Initiated Contacts Delayed	07	00	30*	-33 -37 10*	-67 -44* 17**
		05	00	43**	34**	00
137.	% Student Initiated Contacts Given Brief Feedback	04	00	30**	23*	61 51** 26**
		01	00	00	21*	08
138.	% Student Initiated Contacts Given Long Feedback	02	41 -47** 26**	00	00	81** -26 02
		05	00	00	01	-62* 18 00
139.	% Student Initiated Contacts Involving Personal Concerns	-06 -46** 14**	-02 -35 09*	-04 -65** 40**	-06 -63** 25*	-82** -57** 30**
		01	01	00	05	05

Table 6, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
140.	% Student Initiated Requests Granted	02 51*	37 45*		-05 52**	27 48*
		11*	20*	14	09*	20**
141.	% Student Initiated Requests Delayed		08 -46*		25 -49**	54 -58*
		03	05	02	17*	22*
		-24 -42				
		13*	00	29*	41**	01
142.	% Student Initiated Requests Not Granted	05	05	03	22*	01
143.	% Student Initiated Contacts Which Are Personal Experience Sharing				52* -30	
		00	01	00	17*	02

Table 6 , Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
144.	Private Work Contacts/ Private Work Contacts + Public Response Opportunities	23*	-15 -40* 13**	25**	21*	02
		03	04	50* 08 03	00	01
145.	Procedural Contacts/ Procedural Contacts + Response Opportunities	32*	-17 -34 12**	36**	39 -43* 18**	06
		04	05	48* 18 04	01	24**
146.	Teacher Initiated Work Contacts/Teacher Initiated Work + Procedure Contacts	15*	00	02	00	06
		00	53* -38 21**	01	00	10
147.	Teacher Initiated Work Contacts Involving Praise	-52* -17 04	00	07	31*	-23** -08 02
		02	04	13*	30**	32**

Table 6, Cont'd.

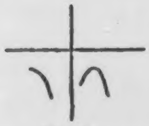
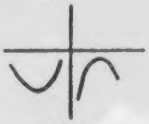
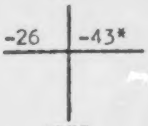
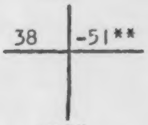
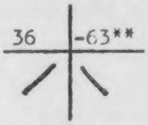
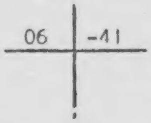
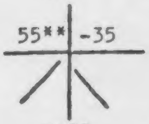
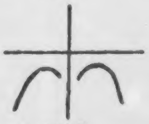
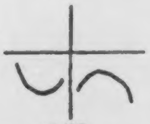
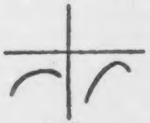
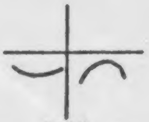
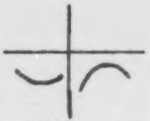
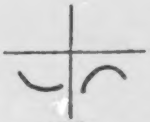
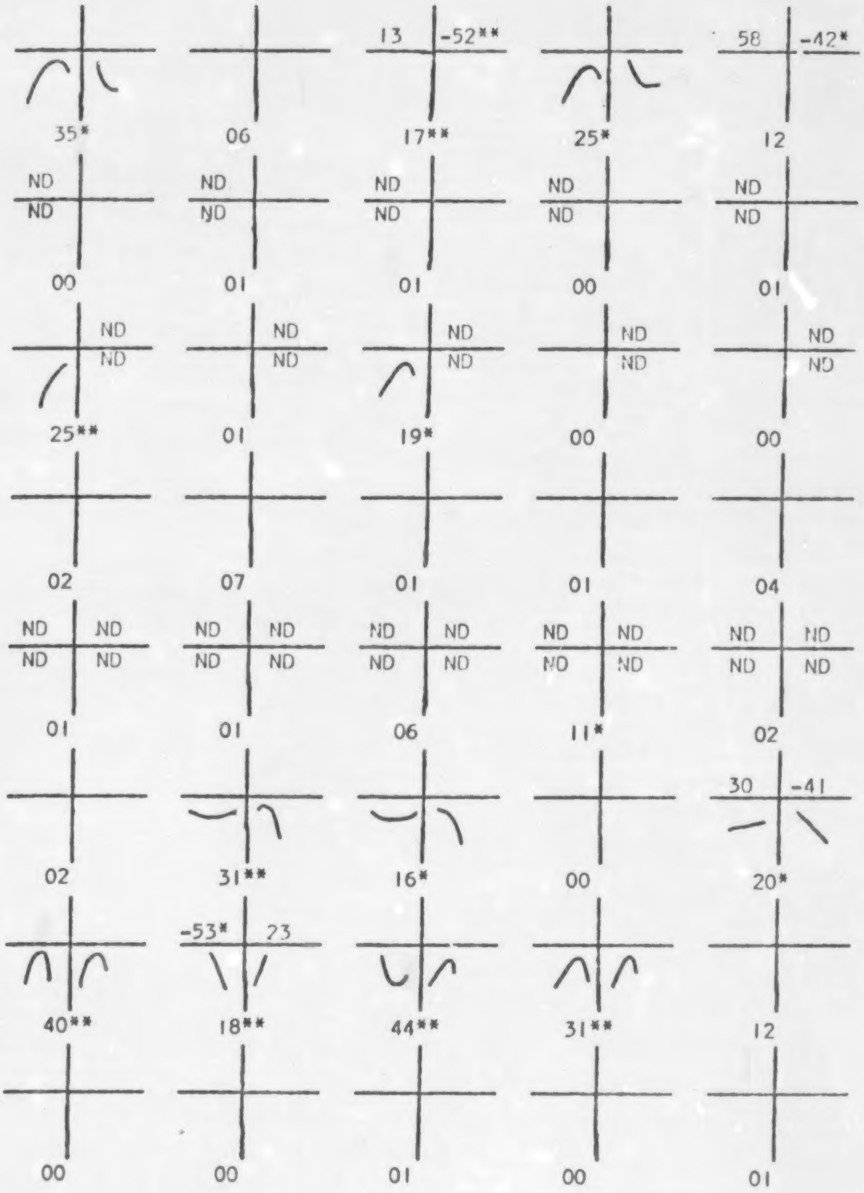
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
148.	Teacher Initiated Work Contacts Involving Mere Observation	 02	 22**	 06	 02	 05
		 00	 02	 02	 01	 00
149.	Teacher Initiated Work Contacts Involving Brief Feedback	 00	 00	 02	 01	 00
		 00	 01	 02	 29**	 03
150.	Teacher Initiated Work Contacts Involving Long Feedback	 -26 -43* 15**	 00	 38 -51** 24**	 36 -63** 30*	 06 -41 16*
		 55** -35 21**	 00	 30**	 45**	 05
151.	% Teacher Initiated Contacts Which are Personal Experience Sharing					
		 21*	 00	 49**	 21*	 30*

Table 6, Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
152.	% Teacher Initiated Procedural Contacts Which Were Management Requests			13 -52**		58 -42*
		35*	06	17**	25*	12
		ND ND	ND ND	ND ND	ND ND	ND ND
		00	01	01	00	01
153.	% Teacher Thanks Student for Doing a Favor Request	ND ND	ND ND	ND ND	ND ND	ND ND
		25**	01	19*	00	00
		02	07	01	01	04
154.	% Teacher Thanks Student Following a Management Request	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND
		01	01	06	11*	02
						30 -41
		02	31**	16*	00	20*
Q.	Combined Teacher Evaluation Statements					
155.	Academic Praise/ Academic Praise + Academic Criticism		-53* 23			
		40**	18**	44**	31**	12
		00	00	01	00	01

Table 6, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
156.	Behavioral Praise/ Total Behavioral Contacts	01	00	02	17*	00
		01	02	02	00	00
157.	Behavioral Warnings/ Behavioral Warnings + Behavioral Criticism	04 37 09*	35 37 12**	01	05	35 43* 18**
		00	01	01	00	00
R.	Discipline and Control Errors					
158.	% Discipline Contacts Involving One or More Error	06	02	05	05	35 -49** 17**
		48* 07 07	00	01	00	01
159.	Target Errors/ Total Errors	ND ND ND ND 02	ND ND ND ND 00	ND ND ND ND 06	ND ND ND ND 03	ND ND ND ND 04
		02	09	07	06	02

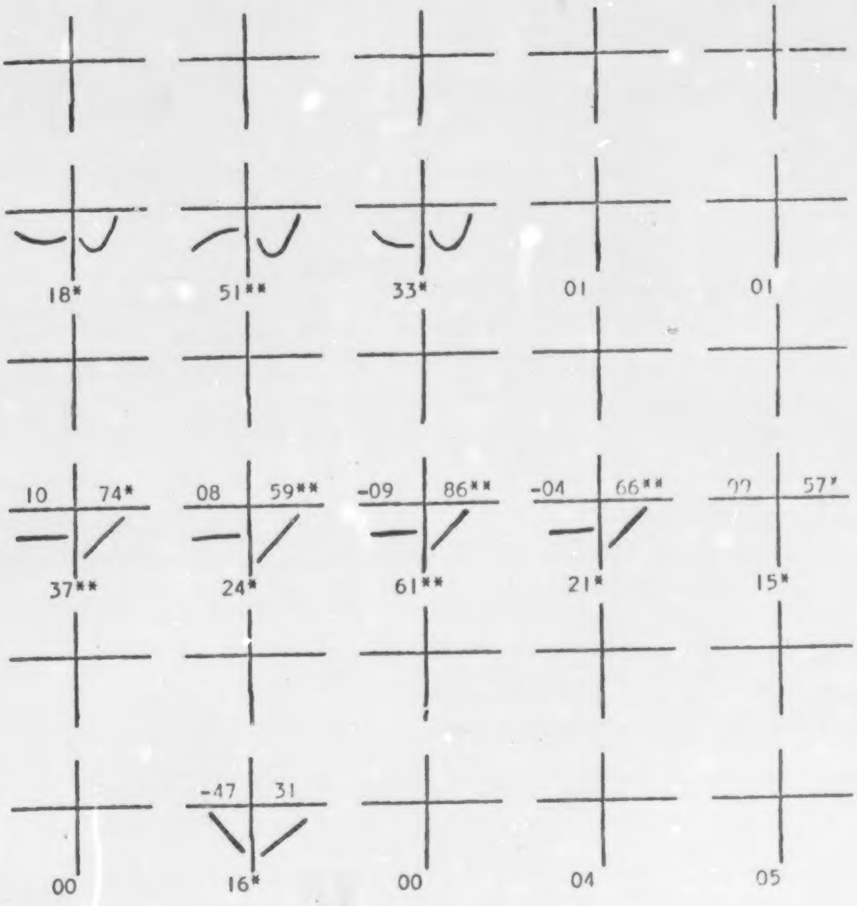
Table 6 , Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
160.	Timing Errors/ Total Errors	05	13	-89** -49 38**	03	ND ND 00
		ND ND 00	ND ND 46**	ND ND 00	ND ND 04	ND ND 03
161.	Overreactions/ Total Errors	ND ND ND ND 15*	ND ND ND ND 22**	ND ND ND ND 25**	ND ND ND ND 14	ND ND ND ND 26*
		59 -49 28**	07	03	00	01
162.	Nonverbal Control Contacts/Total Control Contacts.	00	01	00	01	00
		02	02	02	-27 44* 16*	02
S.	Combined Teacher Feedback Data					
163.	Repeat/Repeat + Rephrase + New Question	-14 -67** 42**	-50 -50** 24**	-55* -46* 21**	13 -56** 19*	ND -67** ND 44**
		00	00	-54* 08 02	02	00

Table 6, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
164.	Rephrase/Repeat + Rephrase + New Question	42*	31, 40 14*	45, 45* 19**	01	10
		00	00	48*, -32 13*	34, -59** 26**	49**
165.	Brief Feedback/ Brief + Long Feedback	05	00	-51*, 38 23**	-44, 45* 20**	-09, 46* 17**
		-48*, 25 15*	00	35**	33**	02
T.	Math Contacts					
166.	Total Public Math Contacts/Total Public Math Contacts + Total Private Math Contacts	01	03	01	02	02
		02	27*	-09, 72** 45**	-23, 58** 19**	07
167.	Total Teacher Initiated Private Math Contacts/ Total Public Math Contacts + Total Private Math Contacts	00	01	01	01	10
		00, -62** 26*	40, -72** 41**	-11, -78** 51**	12, -73** 25**	42, -60** 36*

Table 6, Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
168.	Total Teacher Afforded Math Contacts/Total Math Time	18*	51**	33*	01	01
169.	Total Math Response Opportunities/Total Math Time	10 | 74* 37**	08 | 59** 24*	-09 | 86** 61**	-04 | 66** 21*	02 | 57* 15*
U.	**Dyadic Contacts**					
170.	Total Teacher Initiated Contacts/Total Teaching Time	00	-47 | 31 16*	00	04	05

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[1] Probability values are indicated by asterisks. One asterisk indicates a value of ≤.10. two asterisks indicate a value of ≤.05.

Table 7. Non-linear Relationships between Teacher Process Variables from the Expanded Brophy-Good Observational System (afternoon observations) and Student Residual Gain Scores (averaged across four years) on the Metropolitan Achievement Tests (decimal points omitted).

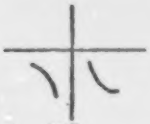
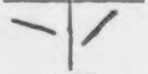
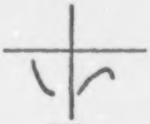
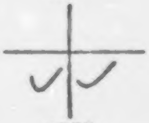
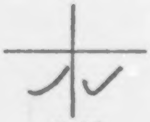
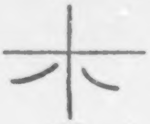
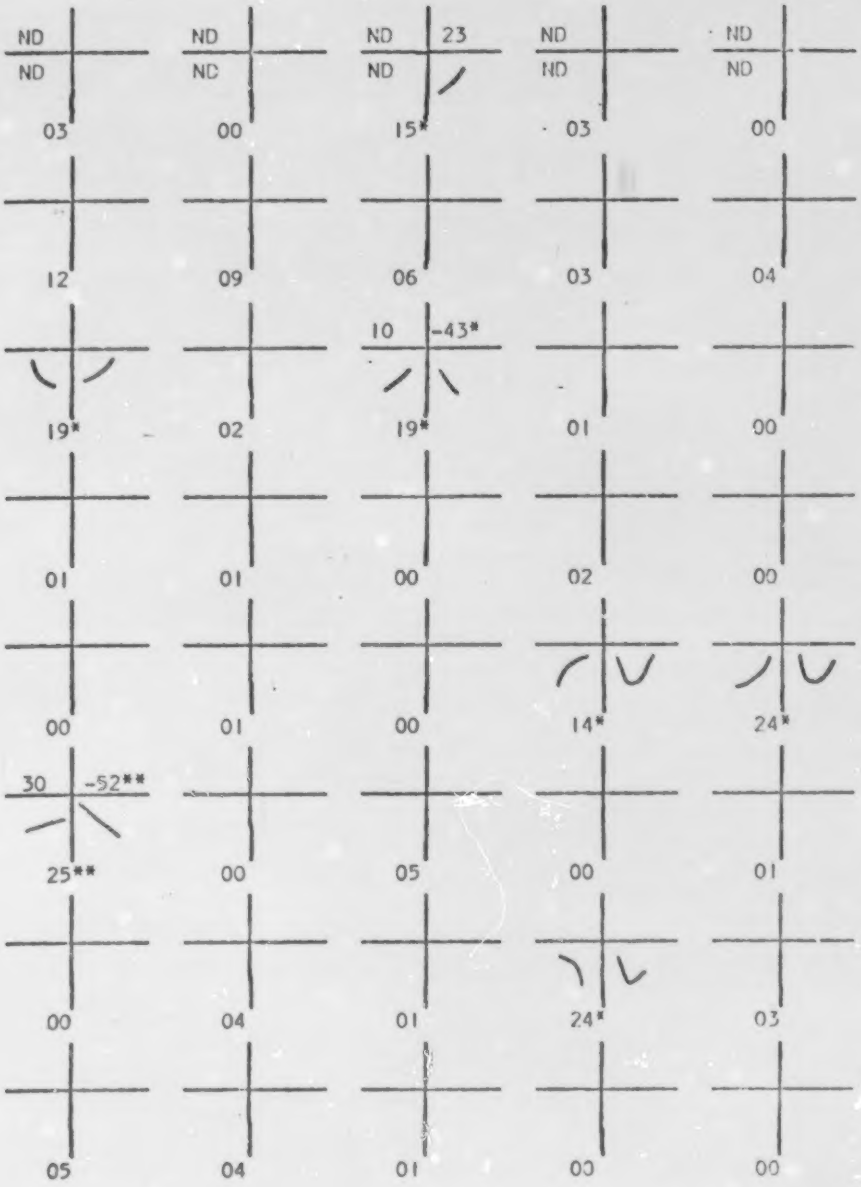
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
A.	Selecting Respondents to Questions					
1.	T Preselects Respondent before Asking Question	09	05	01	 16*	09
		31 71** 31**	-20 66**  32**	43 59** 30**	02	12
2.	Calls on Non-Volunteer	02	01	01	01	00
		04	01	02	02	06
3.	Calls on Volunteer	00	00	00	 27*	01
		06	05	02	00	11
4.	Student Calls Out Answers	01	02	00	 18**	 29**
		04	00	06	 [illegible]5*	01

Table 7, Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
3.	Difficulty Level of Questions	ND ND 03	ND ND 00	ND 23 ND 15*	ND ND 03	ND ND 00
5.	Process Questions/ Process + Product Questions	12	09	06	03	04
		19*	02	10 -43* 19*	01	00
6.	Choice Questions/ Process + Product + Choice	01	01	00	02	00
C.	Quality of Children's Answers					
7.	% Correct	00	01	00	14*	24*
		30 -52** 25**	00	05	00	01
8.	% Part-Correct	00	04	01	24*	03
		05	04	01	00	00

Table 7, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
9.	% Wrong	00	00	01	05	01
		-40 | 70** 49**	-43 | 36 18*	14 | 64** 36**	05	08 | 50* 13*
10.	% "Don't Know"	ND ND 02	ND ND 01	ND ND 32*	ND ND 06	ND ND 01
		23*	03	23*	22**	00
11.	% No Response	00	00	02	03	-74* | -24 05
		01	00	04	10	-35 | -50* 06
D.	Teacher Reactions to Correct Answers					
12.	Praise	00	01	01	00	-77* | -03 01
		03	00	27**	04	37**

Table 7, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
13.	Criticism	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND 35*	ND ND 05	ND ND 29**	ND ND 05	ND 46* ND 11
14.	Failure to Give Feedback	ND ND 03	ND ND 03	ND ND 00	ND ND 03	ND ND 01
		ND ND 04	ND ND 26**	ND ND 02	ND ND 00	ND ND 01
15.	Process Feedback	ND ND ND ND 10*	ND ND ND ND 02	ND ND ND ND 06	ND ND ND ND 02	ND ND ND ND 14*
		ND 54** ND 10	ND ND 05	ND 49* ND 19**	ND 25 ND 12*	ND 37 ND 13*
16.	New Question	01	00	00	04	00
		01	04	01	01	00

Table 7 , Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
E.	Teacher Reactions to Part-Correct Answers	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
17.	Praise					
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND NDN ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
18.	Criticism					
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND NDN ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
19.	Failure to Give Feedback					
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
20.	Process Feedback					
		ND -33 ND — 23**	ND ND 01	ND ND 01	ND ND 02	ND ND 10

Table 7, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
21.	Gives the Answer	ND ND 02	ND ND 00	ND ND 28**	ND ND 22**	ND ND 28**
		68* 55** 33**	63* 64** 40**	48 44 20**	55 31 14*	07
22.	Calls on Someone Else	ND ND 00	ND ND 01	ND ND 01	ND ND 05	ND ND 09
		00	04	03	03	-91** [illegible] [illegible]
23.	Another Student Calls Out the Answer	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
24.	Repeats, Rephrases, or Asks New Question	06	34*	-29 -46* 17**	-54* -42 20**	ND -50* ND 17
		38*	00	00	01	31*

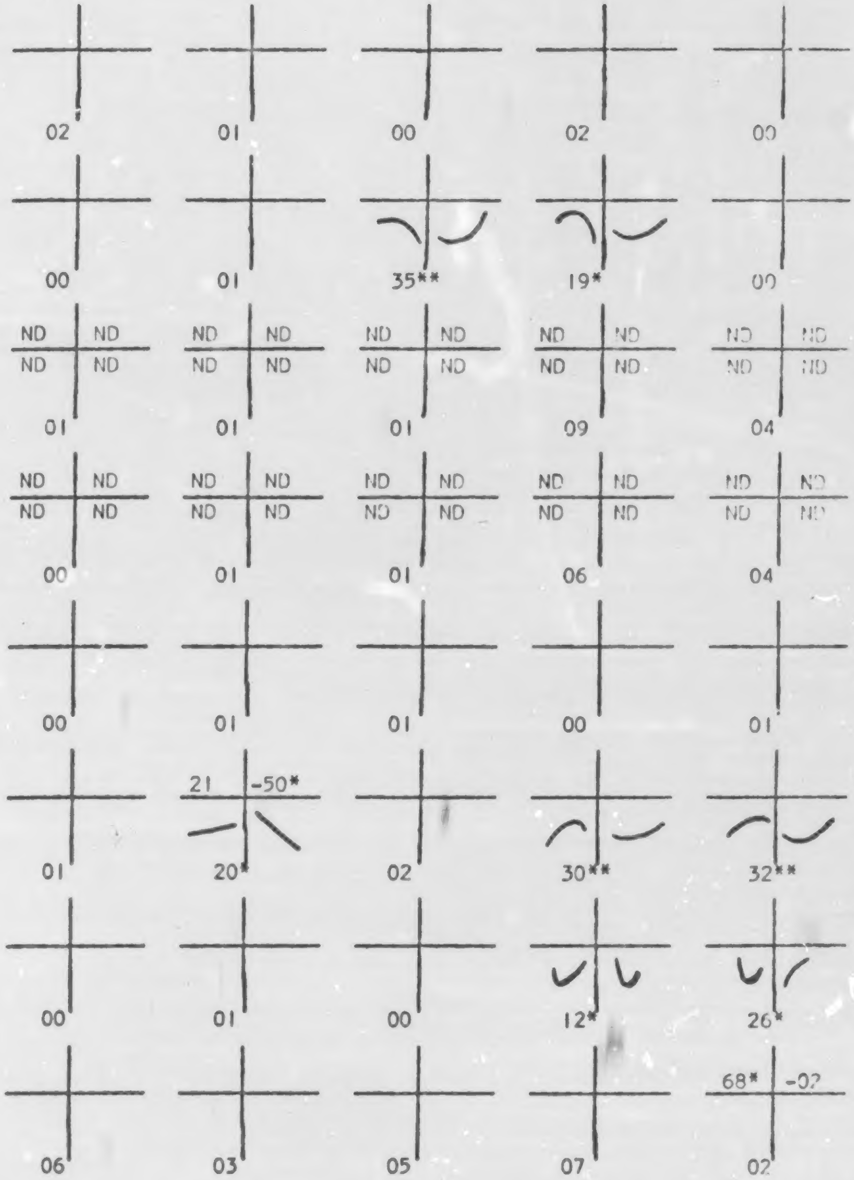
Table 7 , Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
25.	Repeats Question	ND ND ND ND 14**	ND ND ND N 04	ND ND ND ND 18**	ND ND ND ND 26**	ND ND ND ND 29**
		ND ND 12	ND ND 34*	ND ND 07	ND ND 06	ND ND 15
26.	Rephrases or Gives Clue	ND ND 02	ND ND 40**	ND ND 06	ND ND 03	ND ND 03
		-13 -54* 08	09	30*	01	00
27.	Asks New Question	ND ND 03	ND ND 01	ND ND 00	ND ND 01	ND ND 04
		ND ND 00	ND ND 00	ND ND 02	ND ND 00	ND ND 31*
F.	Teacher Reactions to Wrong Answers					
28.	Praise	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND, ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 7 , Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
29.	Criticism	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		-24 ND \ ND 18*	ND ND 01	ND ND 01	ND ND 01	ND ND 00
30.	Failure to Give Feedback	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
31.	Process Feedback	ND ND ND ND 02	ND ND ND ND 00	ND ND ND ND 07	ND ND ND ND 11*	ND ND ND ND 07
		-42 -31 12*	⌒ ‿ 50**	⌒ ‿ 22*	⌒ ‿ 34**	⌒ ‿ 47**
32.	Gives the Answer	ND ∨ ND 38**	ND ⌣ ND 42**	ND ∨ ND 23*	ND ⌣ ND 26**	ND ⌒ ND 46**
		03	01	03	01	01

Table 7, Cont'd.

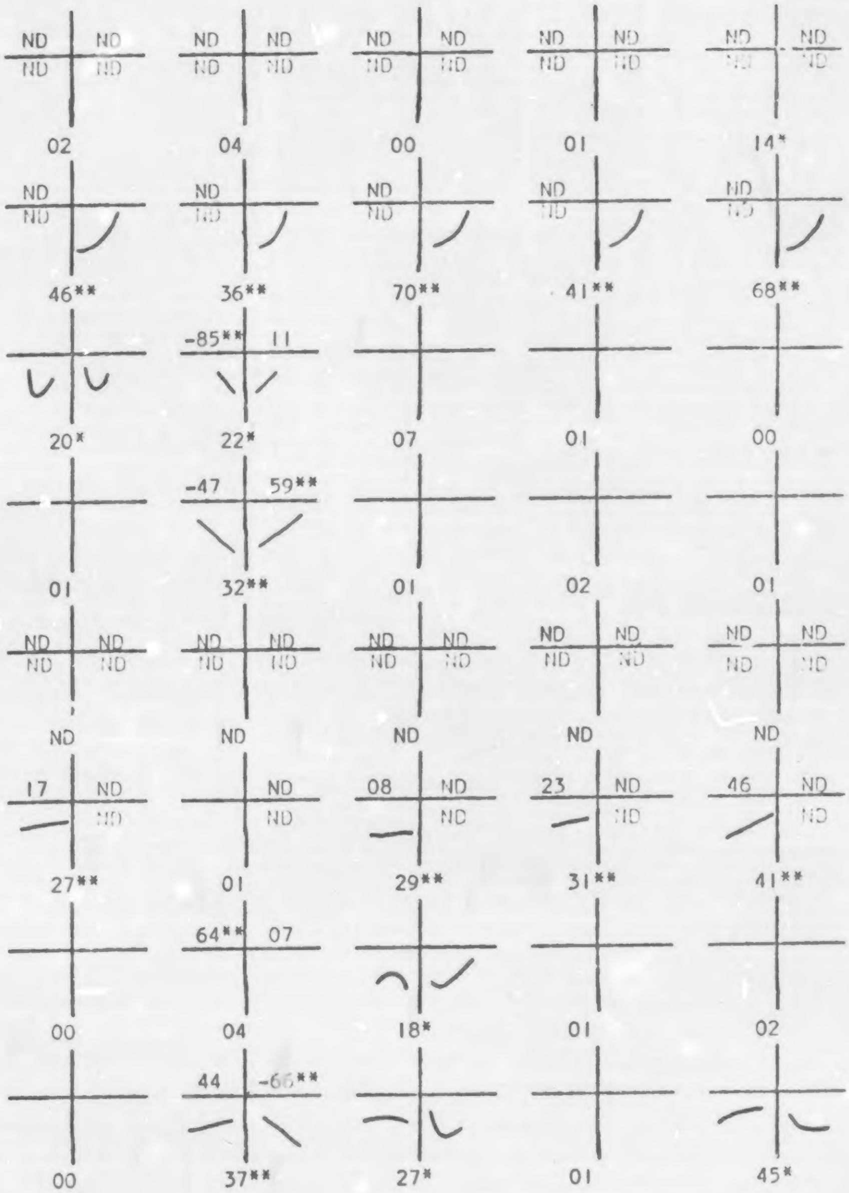


Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
33.	Calls on Someone Else	02	01	00	02	00
		00	01	35**	19*	00
34.	Another Student Calls Out the Answer	ND ND ND ND 01	ND ND ND ND 01	ND ND ND ND 01	ND ND ND ND 09	ND ND ND ND 04
		ND ND ND ND 00	ND ND ND ND 01	ND ND ND ND 01	ND ND ND ND 06	ND ND ND ND 04
35.	Repeats, Rephrases or Asks New Question	00	01	01	00	01
		01	21 -50* 20*	02	30**	32**
36.	Repeats Question	00	01	00	12*	26*
		06	03	05	07	68* -02 02

Table 7, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
37.	Rephrases or Gives Clue	00	00	01	02	00
		01	46**	04	00	00
38.	Asks New Question	ND ND 02	ND ND 01	ND ND 07	ND ND ✓ 14*	ND ND 01
		ND -38 ND 25**	ND ND 01	ND -5[illegible]** ND 36**	ND ND 30**	ND ND 14
G. 39.	Teacher Reactions to "I Don't Know" or No Response Criticism	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND 60** ND 16*	ND 57* ND 15*	ND 45 ND 22**	ND ND 04	ND ND 05
40.	Failure to Give Feedback	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 7, Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
41.	Gives the Answer	ND ND ND ND 02	ND ND ND ND 04	ND ND ND ND 00	ND ND ND ND 01	ND ND ND ND 14*
		ND ND 46**	ND ND 36**	ND ND 70**	ND ND 41**	ND ND 68**
42.	Calls on Someone Else	20*	-85** 11 22*	07	01	00
		01	-47 59** 32**	01	02	01
43.	Another Student Calls Out the Answer	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		17 ND ND 27**	ND ND 01	08 ND ND 29**	23 ND ND 31**	46 ND ND 41**
44.	Repeats, Rephrases, or Asks New Question	00	64** 07 04	18*	01	02
		00	44 -66** 37**	27*	01	45*

Table 7, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
45.	Repeats Question	ND ND ND ND 00	ND ND ND ND 01	ND ND ND ND 02	ND ND ND ND 03	ND ND ND ND 05
		00	46 -59** 32**	06	00	48**
46.	Rephrases or Gives Clue	ND ND 20*	ND ND 47**	ND ND 22*	ND ND 16*	ND ND 25*
		ND ND 00	ND ND 03	ND ND 00	ND ND 03	ND ND 01
47.	Asks New Question	ND ND ND ND 00	ND ND ND ND 10	ND ND ND ND 02	ND ND ND ND 01	ND ND ND ND 00
		ND ND ND ND 01	ND ND ND ND 01	ND ND ND ND 03	ND ND ND ND 00	ND ND ND ND 00
H.	Teacher Reaction to DK					
48.	Criticism	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 7, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
49.	Failure to Give Feedback	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
50.	Gives the Answer	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
51.	Calls on Someone Else	-58 -37 21*	02	00	00	ND ND 82**
52.	Another Student Calls Out the Answer	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 7, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
53.	Repeats, Rephrases or Asks New Question	ND ND ND ND 01	ND ND ND ND 01	ND ND ND ND 06	ND ND ND ND 08	ND ND ND ND 21
54.	Repeats Question	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
55.	Rephrases or Gives Clue	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
56.	Asks New Question	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 7 , Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
1.	Teacher Reaction to No Response					
57.	Criticism	ND ND ND ND 05	ND ND ND ND 06	ND ND ND ND 05	ND ND ND ND 01	ND ND ND ND 00
58.	Failure to Give Feedback	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
59.	Gives the Answer	ND ND ND ND 00	ND ND ND ND 01	ND ND ND ND 00	ND ND ND ND 05	ND ND ND ND 00
60.	Calls on Someone Else	28*	-44 61** 33**	01	01	01

Table 7, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
61.	Another Student Calls Out the Answer	13 ND ND 25**	ND ND 00	08 ND ND 28**	26 ND ND 30**	43 ND ND 41**
62.	Repeats, Rephrases or Asks New Question	00	43 -65** 36**	26*	01	44**
63.	Repeats Question	00	40 -58** 30**	06	19*	52**
64.	Rephrases or Gives Clue	ND ND [illegible]	ND ND 04	ND ND 01	ND ND 03	ND ND 01

Table 7, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
65.	Asks New Question	ND | ND ND | ND	ND | ND ND | ND	ND | ND ND | ND	ND | ND ND | ND	ND | ND ND | ND
J.	Teacher Reactions Combined Across All Response Opportunities	ND	ND	ND	ND	ND
66.	Praise	01	22*	00	01	03
		02	00	04	04	05
66B.	Criticism After All Incorrect Answers	16*	01	04	00	00
			-49* | -10			
67.	Failure to Give Feedback	03	02	00	02	01
				54* | -05		
		02	00	02	00	00

Table 7 , Cont'd.

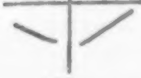
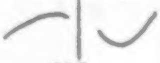
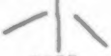
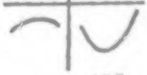
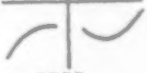
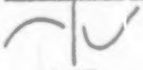
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
68.	Process Feedback	02 │ 40 11*	02	18 │ 47* 17**	59** │ 25 11*	13
		-19 │ 44*  18*	02	-02 │ 45* 09	06	04
69.	New Question	01	00	00	03	00
		01	04	01	01	00
70.	Repeat, Rephrase or Asks New Question After Failure to Answer`	01	01	-12 │ -31 10*	05	ND ND 08
		 28*	53* │ -47*  26**	 18*	 25**	 36**
71.	Repeats Question After Failure to Answer Correctly	01	01	02	-56** │ -11 10*	-83** │ -19 06
		00	03	01	02	70* │ 00 05

Table 7, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
72.	Gives the Answer After Failure to Answer Correctly	17*	01	00	00	04
		08	20*	09	01	02
73.	Calls on Another Student After Failure to Answer Correctly	03	00	✓ ✓ 20*	✓ ✓ 15*	00
		51**	43**	42**	30**	41**
74.	Another Student Calls Out Answer After Failure to Answer Correctly	ND ND 01	ND ND 28**	ND ND 05	ND ND 02	ND ND 02
		50* ND ND 16*	ND ND 01	57** ND ND 16*	ND ND 03	ND ND 05
K.	Student Response Opportunities					
75.	Response Opportunities/ Total Teaching Time	✓ ✓ 28**	-08 42* 12*	05	00	✓ ✓ 26**
		04	02	01	01	00

Table 7, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
L.	Student Initiated Questions (SIQ's)					
76.	% SIQ's Irrelevant	| | 00	| | 01	| | 05	| ∩ | ∩ 18*	ND | ND | 03
		ND | ND ND | ND 00	ND | ND ND | ND 01	ND | ND ND | ND 01	ND | ND ND | ND 01	ND | ND ND | ND 02
77.	% SIQ's Called Out	ND | ND | ∩ 23*	ND | ND | 07	ND | ND | 02	ND | ND | ⌒ 24*	ND | ND | 00
		| | 00	| | 01	| | 00	| | 00	| | 00
78.	Praise of Question after Relevant SIQ's	ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND
		ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND
79.	Criticism of Question after Relevant SIQ's	ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND
		ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND

Table 7, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
80.	% Relevant SIO's Given No Feedback	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
81.	% Relevant SIO's Delayed	ND ND ND ND 05	ND ND ND ND 04	ND ND ND ND 00	ND ND ND ND 02	ND ND ND ND 00
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
82.	% Relevant SIO's Not Accepted	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND 03	ND ND 00	ND ND 07	ND ND 25*	ND ND 41**
83.	% Relevant SIO's Given Brief Feedback	ND ND 02	ND ND 03	ND ND 02	ND ND 22*	ND ND 03
		-45 42 21*	-58 51* 29**	-06 54* 15*	-43 44 20*	-83** 51* 34*

Table 7, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
84.	% Relevant SIQ's Given Long Feedback	ND ND 24*	ND ND 11	ND ND 10	ND ND 03	ND ND 01
		ND ND ND ND 00	ND ND ND ND 00	ND ND ND ND 04	ND ND ND ND 01	ND ND ND ND 00
85.	% Relevant SIQ's Redirected to Class	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
86.	Behavioral Praise of Relevant SIQ's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
87.	Behavioral Criticism of Relevant SIQ's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 7, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
88.	Behavioral Warning after Relevant SIQ's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
89.	Criticism of Question after Irrelevant SIQ's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
90.	% Irrelevant SIQ's Given No Feedback	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
91.	% Irrelevant SIQ's Delayed	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 7, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
92.	% Irrelevant SIQ's Given Brief Feedback	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND
		11	11	14	03	88**
		ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND
		ND	ND	ND	ND	ND
93.	% Irrelevant SIQ's Given Long Feedback	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND
		ND	ND	ND	ND	ND
		ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND
		ND	ND	ND	ND	ND
94.	% Irrelevant SIQ's Not Accepted	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND
		ND	ND	ND	ND	ND
		ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND
		12	10	66*	10	23
95.	% Irrelevant SIQ's Redirected to Class	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND
		ND	ND	ND	ND	ND
		ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND
		ND	ND	ND	ND	ND

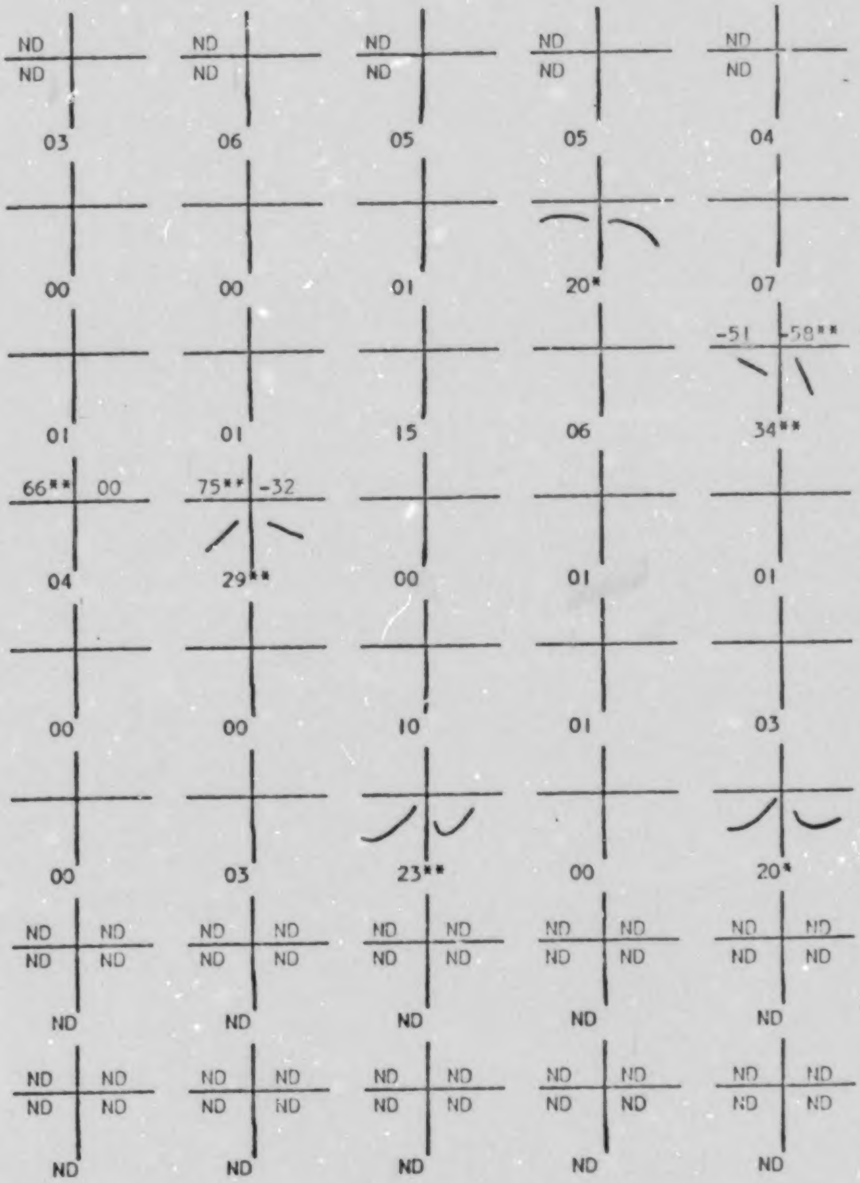
Table 7, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
96.	Behavior Criticism after Irrelevant SIQ's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
97.	Behavioral Warning after Irrelevant SIQ's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
M.	Student Initiated Public Interactions	01	00	07	01	03
98.	Student Initiated Comments and Questions/Total Response Opportunities	05	00	09	22*	00
N.	Student Initiated Comments (SIC's)	21*	-11 -49** 23*	03	06	04
99.	% SIC's Relevant	ND ND ND ND 07	ND ND ND ND 05	ND ND ND ND 02	ND ND ND ND 01	ND ND ND ND 02

Table 7, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
100.	% SIC's Called Out	-21 -33 10*	08	04	06	04
		30*	07	31**	34**	49**
101.	Praise of Comment after Relevant SIC's	ND ND ND ND 01	ND ND ND ND 02	ND ND ND ND 02	ND ND ND ND 00	ND ND ND ND 00
		ND ND ND ND 03	ND ND ND ND 05	ND ND ND ND 12*	ND ND ND ND 00	ND ND ND ND 04
102.	% Relevant SIC's Given No Feedback	ND ND 02	ND ND 00	ND ND 07	ND ND 00	ND ND 00
		-79** ND ND 05	-72** ND ND 35**	-59* ND ND 00	ND ND 37**	ND ND 24*
103.	% Relevant SIC's Delayed	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND 02	ND ND ND ND 00	ND ND ND ND 00	ND ND ND ND 03	ND ND ND ND 00

Table 7, Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
104.	% Relevant SIC's Not Accepted	ND ND 03	ND ND 06	ND ND 05	ND ND 05	ND ND 04
		00	00	01	20*	07
105.	% Relevant SIC's Accepted	01	01	15	06	-51 -58** 34**
		66** 00 04	75** -32 29**	00	01	01
106.	% Relevant SIC's Integrated into Discussion Topic	00	00	10	01	03
		00	03	23**	00	20*
107.	% Relevant SIC's Which Cause a Shift in Topic	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 7, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
108.	Behavioral Praise after Relevant SIC's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
109.	Behavioral Criticism after Relevant SIC's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
110.	Behavioral Warning after Relevant SIC's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
111.	Praise of Comment after Irrelevant SIC's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 7, Cont'd.

Number	Process Variable	Word Knowledge		Word Discrimination		Reading		Arithmetic Computation		Arithmetic Reasoning	
112.	% Irrelevant SIC's Given No Feedback	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		00		02		07		00		01	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		15		28		28		08		12	
113.	% Irrelevant SIC's Delayed	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
114.	% Irrelevant SIC's Not Accepted	ND		ND		ND	48*	ND		ND	
		ND		ND		ND		ND		ND	
		12		14		30**		13		19	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
115.	% Irrelevant SIC's Accepted	ND		ND		ND		ND		ND	
		ND		ND		ND		ND		ND	
		03		01		03		05		05	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		04		06		14		00		06	

Table 7, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
116.	% Irrelevant SIC's Integrated Into Discussion Topic	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
117.	% Irrelevant SIC's Which Cause a Shift in Topic	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
118.	Behavioral Praise after Irrelevant SIC's					
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
119.	Behavioral Criticism after Irrelevant SIC's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 7, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
120.	Behavioral Warning after Irrelevant SIC's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
O.	Self and Opinion Questions					
121.	Self Questions/Process + Product + Choice Questions	01	27*	01	03	00
		01	16*	00	20**	00
122.	% Self Questions Which Were Subject-Matter Related	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		80** 10 10	68** 06 07	12	01	00
123.	% Self Questions Related to Personal Preference	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		00	03	61* 17 07	30**	03

Table 7, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
124.	Opinion Questions/ Process + Product + Choice Questions	ND ND 07	ND -58** ND 24**	ND -43* ND 13**	ND ND 05	ND ND 12
		00	00	01	14*	01
125.	% Opinion Questions Given No Response	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
126.	% Opinion Questions Followed by Praise	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		04	02	01	03	00
127.	% Opinion Questions Criticized					
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 7 , Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
128.	% Opinion Questions Given No Feedback					
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
129.	% Opinion Questions Followed by Teacher Disagreement	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
130.	% Student Opinions Accepted	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND 02	ND ND 01	ND ND 00	ND ND 04	ND ND 03
131.	% Student Opinions Integrated into Discussion Topic	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 7, Cont'd.

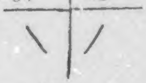
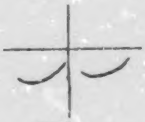
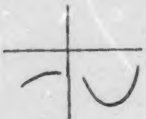
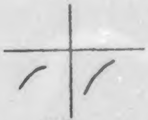
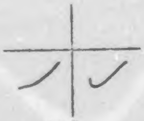
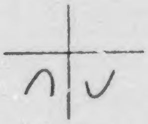
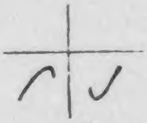
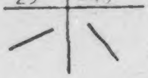
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
P.	Private Dyadic Contacts					
132.	% Private Contacts Student Initiated	04	00	-01 46**  23*	40 26 10*	04
		08	 28*	06	01	02
133.	Student Initiated Work Contacts Involving Praise	02	00	00	06	00
		00	 20*	01	00	01
134.	Student Initiated Work Contacts Involving Criticism	01	00	02	 17*	 18*
		03	-52* 06 02	03	02	06
135.	% Private Work Contacts Student Initiated	00	00	 28**	 24*	01
		00	29 -40  16*	00	02	00

Table 7, Cont'd.

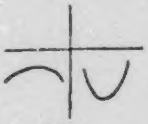
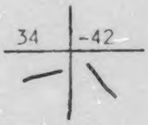
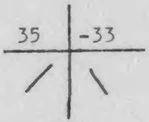
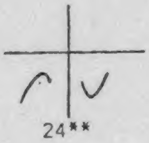
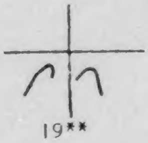
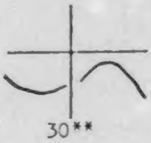
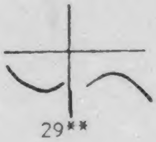
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
136.	% Student Initiated Contacts Delayed	00	06	00	01	01
		 25*	02	 34 | -42 18**	61** | 00 08	03
137.	% Student Initiated Contacts Given Brief Feedback	00	00	01	08	03
		00	02	00	00	03
138.	% Student Initiated Contacts Given Long Feedback	00	00	 35 | -33 18*	00	04
		00	01	00	02	00
139.	% Student Initiated Contacts Involving Personal Concerns	03	02	 24**	 19**	01
		04	01	 30**	 29**	01

Table 7, Cont'd.

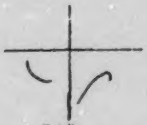
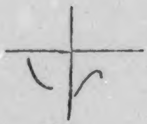
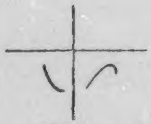
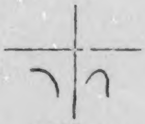
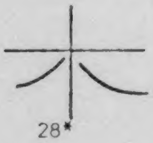
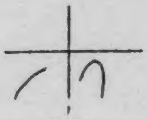
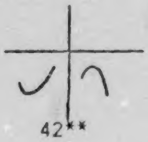
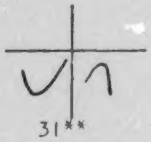
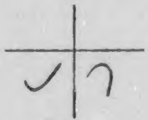
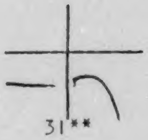
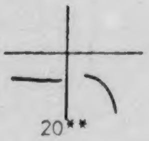
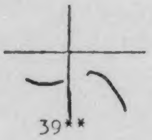
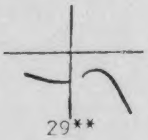
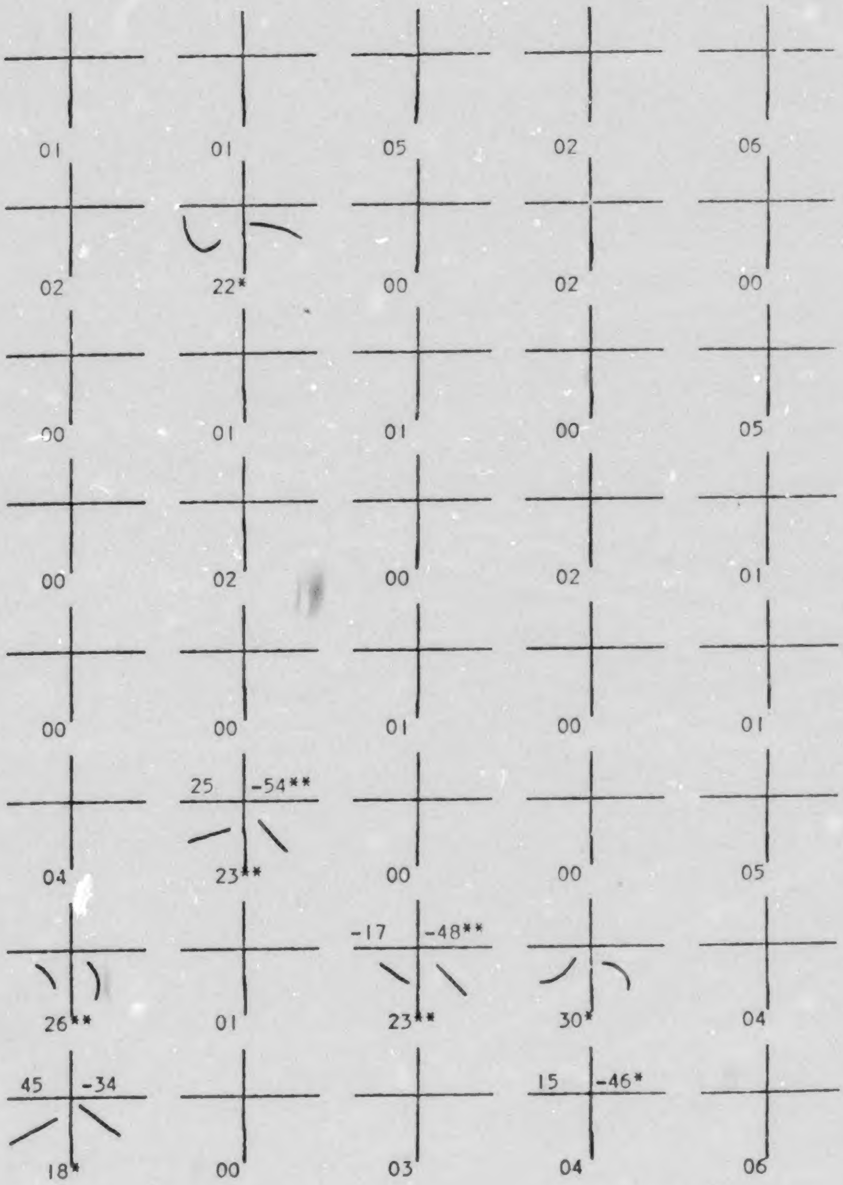
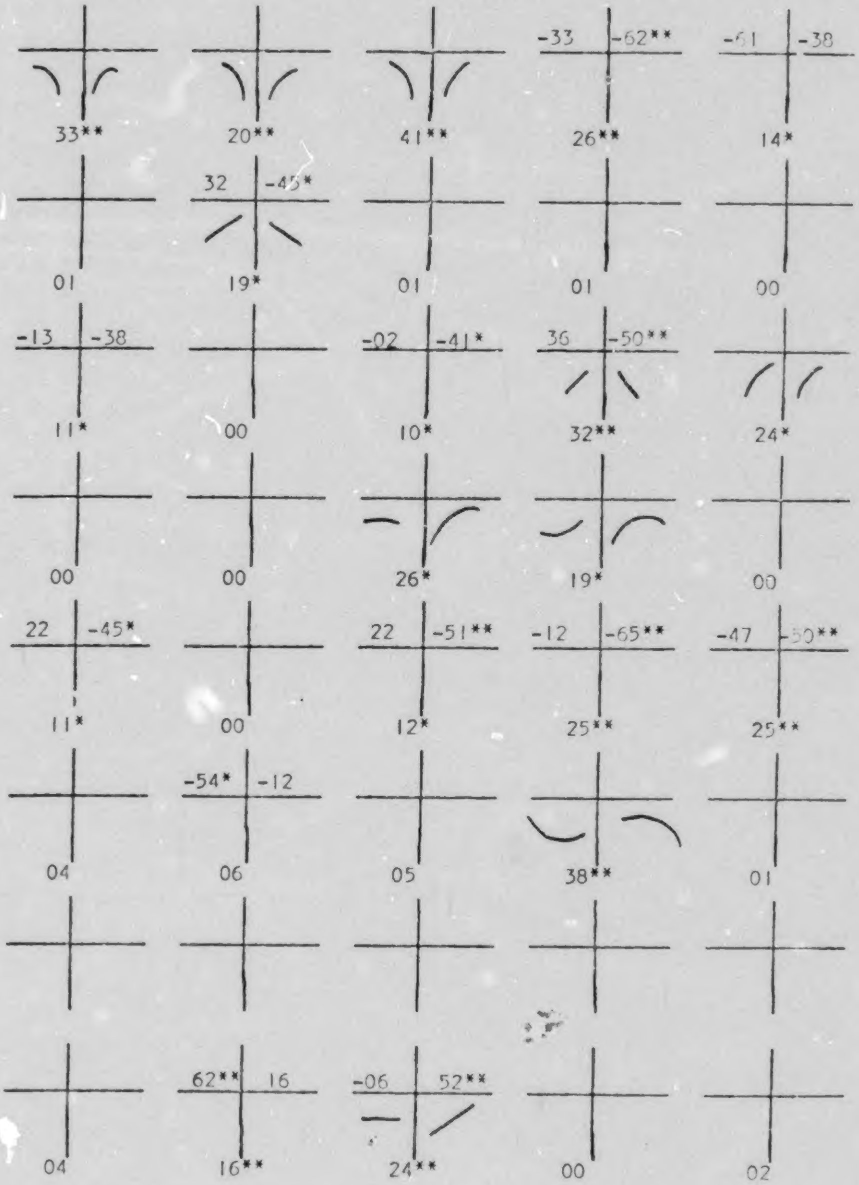
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
140.	% Student Initiated Requests Granted	 31*	02	 32*	 26**	 20*
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
141.	% Student Initiated Requests Delayed	-48* 04 01	01	00	01	07
		01	00	00	 28*	00
142.	% Student Initiated Requests Not Granted	 30**	01	 42**	 31**	 33*
143.	% Student Initiated Contacts Which Are Personal Experience Sharing					
		 31**	01	 20**	 39**	 29**

Table 7, Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
144.	Private Work Contacts/ Private Work Contacts + Public Response Opportunities	01	01	05	02	06
		02	22*	00	02	00
145.	Procedural Contacts/ Procedural Contacts + Response Opportunities	00	01	01	00	05
		00	02	00	02	01
146.	Teacher Initiated Work Contacts/Teacher Initiated Work + Procedure Contacts	00	00	01	00	01
		04	25 -54** 23**	00	00	05
147.	Teacher Initiated Work Contacts Involving Praise	26**	01	-17 -48** 23**	30*	04
		45 -34 18*	00	03	15 -46* 04	06

Table 7, Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
148.	Teacher Initiated Work Contacts Involving Mere Observation	33**	20**	41**	-33 -62** 26**	-61 -38 14*
		01	32 -45* 19*	01	01	00
149.	Teacher Initiated Work Contacts Involving Brief Feedback	-13 -38 11*	00	-02 -41* 10*	36 -50** 32**	24*
		00	00	26*	19*	00
150.	Teacher Initiated Work Contacts Involving Long Feedback	22 -45* 11*	00	22 -51** 12*	-12 -65** 25**	-47 -50** 25**
		04	-54* -12 06	05	38**	01
151.	% Teacher Initiated Contacts Which are Personal Experience Sharing					
		04	62** 16 16**	-06 52** 24**	00	02

Table 7, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
152.	% Teacher Initiated Procedural Contacts Which Were Management Requests	01	00	00	00	04
		00	01	00	07	01
153.	% Teacher Thanks Student for Doing a Favor Request	02	00	00	02	02
		01	01	01	01	06
154	% Teacher Thanks Student Following a Management Request	ND ND 05	ND ND 02	ND ND 22**	ND ND 24**	ND ND 25**
		03	00	00	43 -31 13*	32 -48* 25*
0.	Combined Teacher Evaluation Statements					
155.	Academic Praise/ Academic Praise + Academic Criticism	23*	00	47**	27**	25**
		52* -26 17*	61** -12 03	02	00	01

Table 7 , Cont'd.

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<tr><th>Number</th><th>Process Variable</th><th colspan="2">Word Knowledge</th><th colspan="2">Word Discrimination</th><th colspan="2">Reading</th><th colspan="2">Arithmetic Computation</th><th colspan="2">Arithmetic Reasoning</th></tr>
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<tr><td></td><td></td><td>ND</td><td></td><td>ND</td><td></td><td>ND</td><td></td><td>ND</td><td></td><td>ND</td><td></td></tr>
<tr><td>156.</td><td>Behavioral Praise/ Total Behavioral Contacts</td><td colspan="2">00</td><td colspan="2">00</td><td colspan="2">00</td><td colspan="2">11*</td><td colspan="2">00</td></tr>
<tr><td></td><td></td><td></td><td></td><td>-44</td><td>-28</td><td>-82**</td><td>02</td><td>-57**</td><td>-04</td><td>-65*</td><td>00</td></tr>
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<tr><td></td><td></td><td colspan="2">04</td><td colspan="2">11*</td><td colspan="2">01</td><td colspan="2">03</td><td colspan="2">07</td></tr>
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<tr><td>157.</td><td>Behavioral Warnings/ Behavioral Warnings + Behavioral Criticism</td><td colspan="2">00</td><td colspan="2">00</td><td colspan="2">04</td><td colspan="2">06</td><td colspan="2">02</td></tr>
<tr><td></td><td></td><td></td><td></td><td>59**</td><td>16</td><td></td><td></td><td>49*</td><td>-03</td><td></td><td></td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
<tr><td></td><td></td><td colspan="2">00</td><td colspan="2">10</td><td colspan="2">00</td><td colspan="2">02</td><td colspan="2">03</td></tr>
<tr><td>R.</td><td>Discipline and Control Errors</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>82**</td><td>06</td></tr>
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<tr><td>158.</td><td>% Discipline Contacts Involving One or More Error</td><td colspan="2">03</td><td colspan="2">00</td><td colspan="2">05</td><td colspan="2">00</td><td colspan="2">02</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr>
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<tr><td></td><td></td><td colspan="2">01</td><td colspan="2">00</td><td colspan="2">00</td><td colspan="2">01</td><td colspan="2">00</td></tr>
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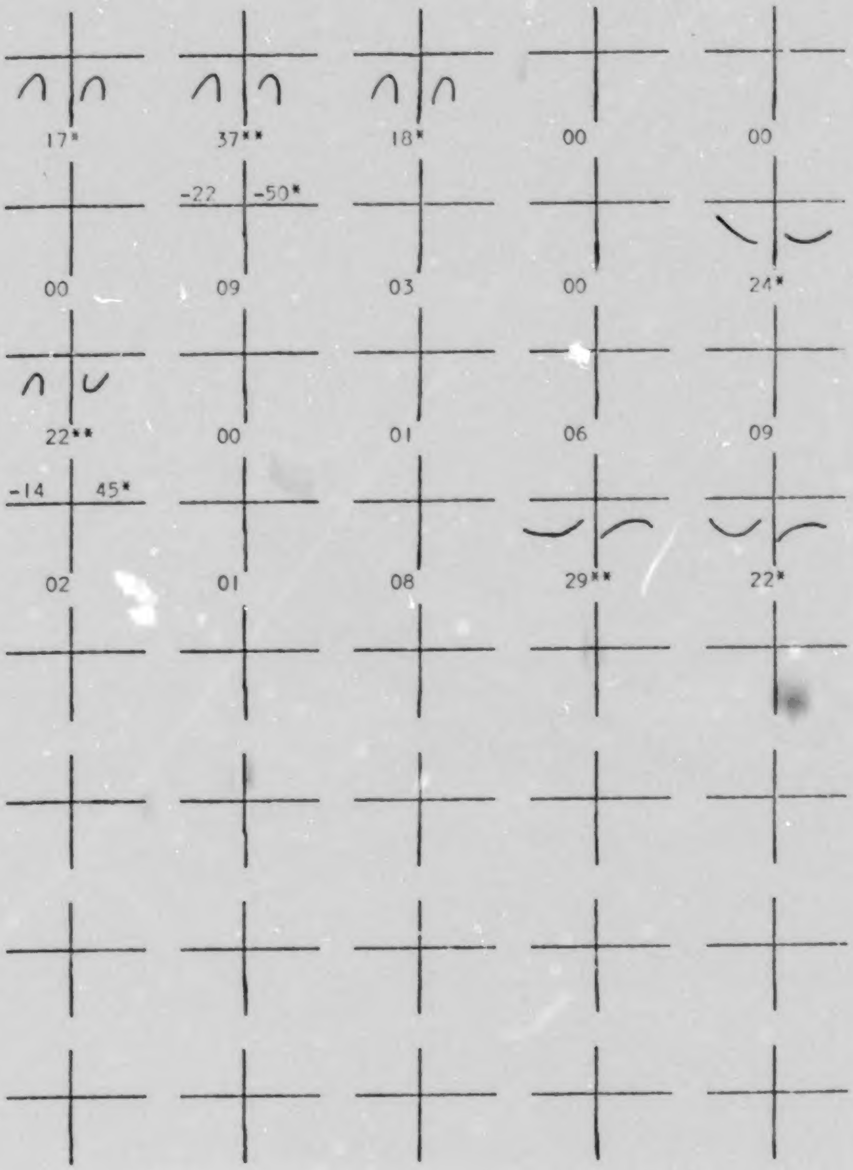
<tr><td>159.</td><td>Target Errors/ Total Errors</td><td colspan="2">00</td><td colspan="2">25*</td><td colspan="2">01</td><td colspan="2">02</td><td colspan="2">00</td></tr>
<tr><td></td><td></td><td>ND</td><td></td><td>ND</td><td></td><td>ND</td><td></td><td>ND</td><td></td><td>ND</td><td></td></tr>
<tr><td></td><td></td><td>ND</td><td></td><td>ND</td><td></td><td>ND</td><td></td><td>ND</td><td></td><td>ND</td><td></td></tr>
<tr><td></td><td></td><td colspan="2">03</td><td colspan="2">46**</td><td colspan="2">00</td><td colspan="2">00</td><td colspan="2">00</td></tr>
</table>

Table 7, Cont'd.

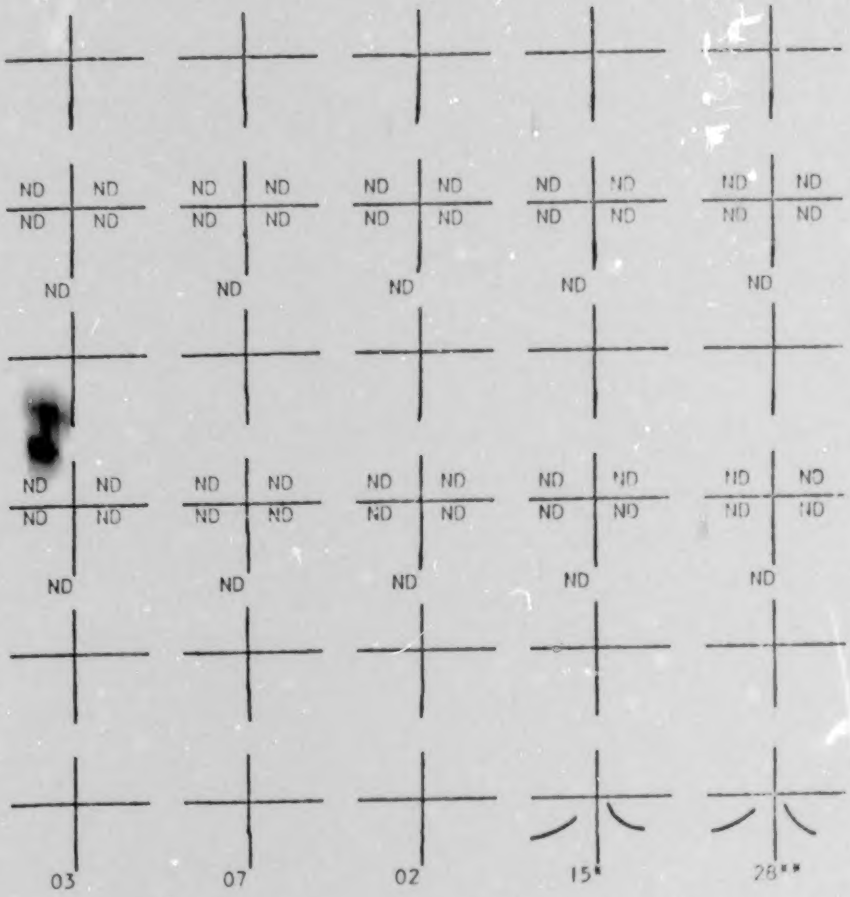
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
160.	Timing Errors/ Total Errors	ND ND 00	-64** ND ND 01	ND ND 00	ND ND 04	ND ND 00
		ND ND 00	ND ND 05	ND ND 01	ND ND 00	ND ND ND
161.	Overreactions/ Total Errors	ND ND 12	06 ND ND 14*	ND ND 11	ND ND 00	ND ND 30*
		ND ND 01	ND ND 02	ND ND 00	ND ND 01	ND ND 06
162.	Nonverbal Control Contacts/Total Control Contacts.	06	06	01	00	00
		01	01	05	07	03
S.	Combined Teacher Feedback Data					
163.	Repeat/Repeat + Rephrase + New Question	03	03	01	02	04
		02	07	06	03	68* 30 08

Table 7 , Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
164.	Rephrase/Repeat + Rephrase + New Question	17*	37**	18*	00	00
		00	-22 -50* 09	03	00	24*
165.	Brief Feedback/ Brief + Long Feedback	22**	00	01	06	09
		-14 45* 02	01	08	29**	22*
T.	Math Contacts					
166.	Total Public Math Contacts/Total Public Math Contacts + Total Private Math Contacts					
167.	Total Teacher Initiated Private Math Contacts/ Total Public Math Contacts + Total Private Math Contacts					

Table 7, Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
168.	Total Teacher Afforded Math Contacts/Total Math Time	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
169.	Total Math Response Opportunities/Total Math Time	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
U.	Dyadic Contacts					
170.	Total Teacher Initiated Contacts/Total Teaching Time	03	07	02	15*	28**

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[1] Probability values are indicated by asterisks. One asterisk indicates a value of ≤.10; two asterisks indicate a value of ≤.05.

Table 8. Non-linear Relationships between Teacher Process Variables from the Expanded Brophy-Good Observational System (reading group observations) and Student Residual Gain Scores (averaged across four years) on the Metropolitan Achievement Tests (decimal points omitted).[1]

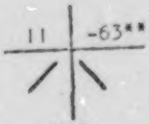
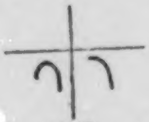
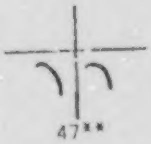
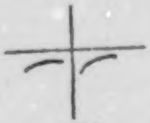
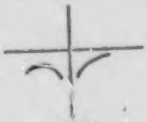
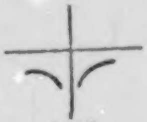
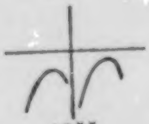
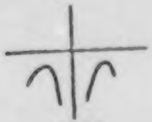
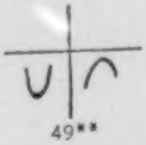
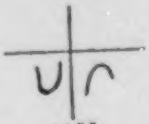
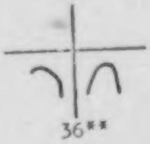
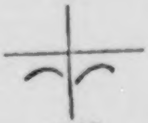
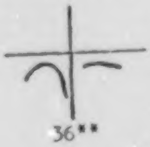
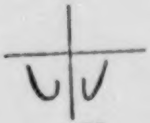
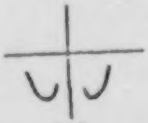
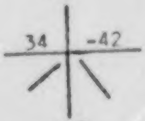
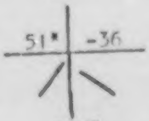
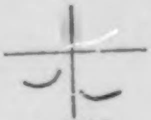
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
A.	Selecting Respondents to Questions	 11 -63** 34*	05	04 -61** 19**	 50**	 47**
1.	% Preselects Respondent before Asking Question	 44**	 30**	 46**	-14 54* 06	-05 62** 18*
2.	Calls on Non-Volunteer	00	01	01	02	02
		03	00	06	 19**	03
3.	Calls on Volunteer	 37**	04 44* 12*	 49**	 41**	 36**
		04	 24**	07	 36**	06
4.	Student Calls Out Answers	 18**	 23*	00	00	00
		06	00	 34 -42 23*	 51* -36 22**	 36**

Table 8, Cont'd.

Number Process Variable — Word Knowledge — Word Discrimination — Reading — Arithmetic Computation — Arithmetic Reasoning

B. Difficulty Level of Questions

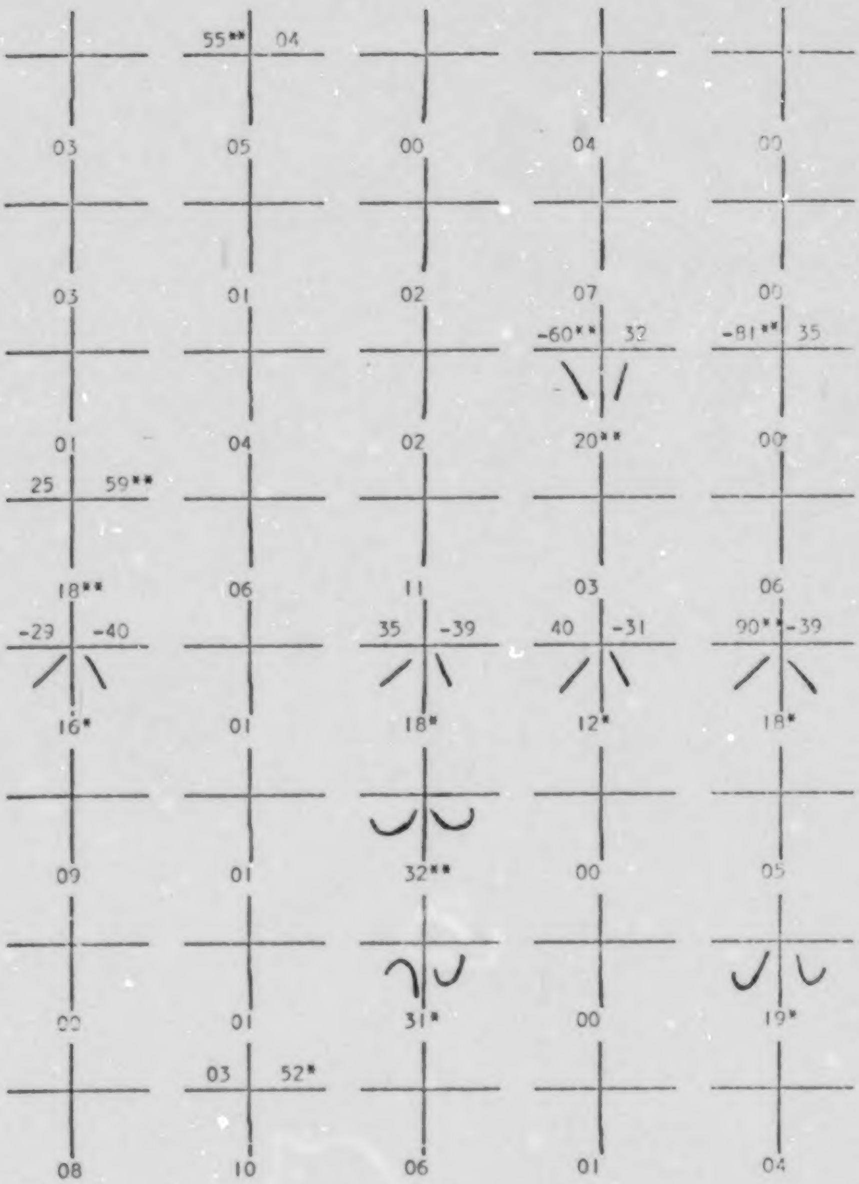
5. Process Questions/ Process + Product Questions

6. Choice Questions/ Process + Product + Choice

C. Quality of Children's Answers

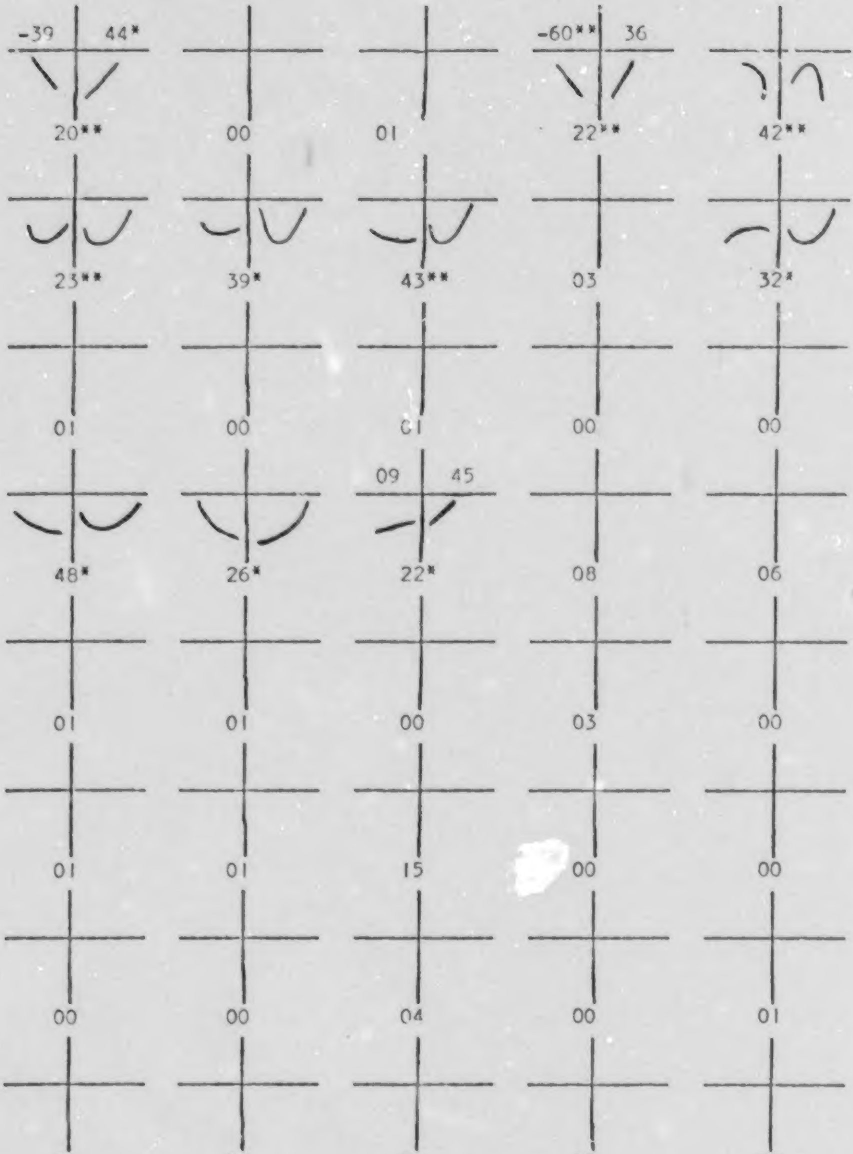
7. % Correct

8. % Part-Correct



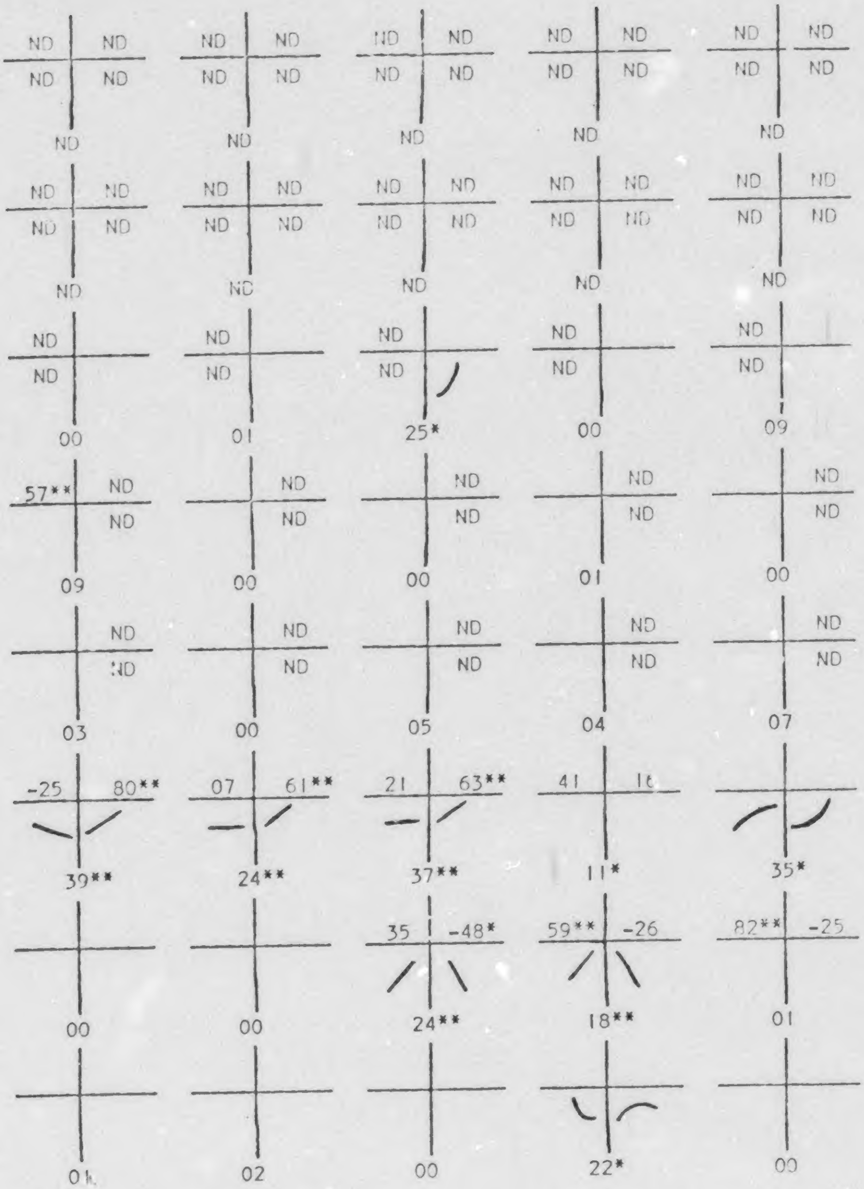
55** 04
03 05 00 04 00
03 01 02 07 00
-60** 32
-81** 35
01 04 02 20** 00
25 59**
18** 06 11 03 06
-29 -40
35 -39
40 -31
90** -39
16* 01 18* 12* 18*
09 01 32** 00 05
00 01 31* 00 19*
03 52*
08 10 06 01 04

Table 8, Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
9.	% Wrong	-39 44* 20**	00	01	-60** 36 22**	42**
		23**	39*	43**	03	32*
10.	% "Don't Know"	01	00	01	00	00
		48*	26*	09 45 22*	08	06
11.	% No Response	01	01	00	03	00
		01	01	15	00	00
D.	Teacher Reactions to Correct Answers					
12.	Praise	00	00	04	00	01
		00	03	02	02	03

Table 8, Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
13.	Criticism	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
14.	Failure to Give Feedback	ND ND 00	ND ND 01	ND ND 25*	ND ND 00	ND ND 09
		57** ND ND 09	ND ND 00	ND ND 00	ND ND 01	ND ND 00
15.	Process Feedback	ND ND 03	ND ND 00	ND ND 05	ND ND 04	ND ND 07
		-25 80** 39**	07 61** 24**	21 63** 37**	41 16 11*	35*
16.	New Question	00	00	35 -48* 24**	59** -26 18**	82** -25 01
		01	02	00	22*	00

Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
E.	Teacher Reactions to Part-Correct Answers					
17.	Praise	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
18.	Criticism	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
19.	Failure to Give Feedback	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
20.	Process Feedback	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND 01	ND ND ND ND 04	ND ND ND ND 01	ND ND ND ND 06	ND ND ND ND 00

Table 8 , Cont'd.

Number | Process Variable | Word Knowledge | Word Discrimination | Reading | Arithmetic Computation | Arithmetic Reasoning

21. Gives the Answer

22. Calls on Someone Else

23. Another Student Calls Out the Answer

24. Repeats, Rephrases, or Asks New Question

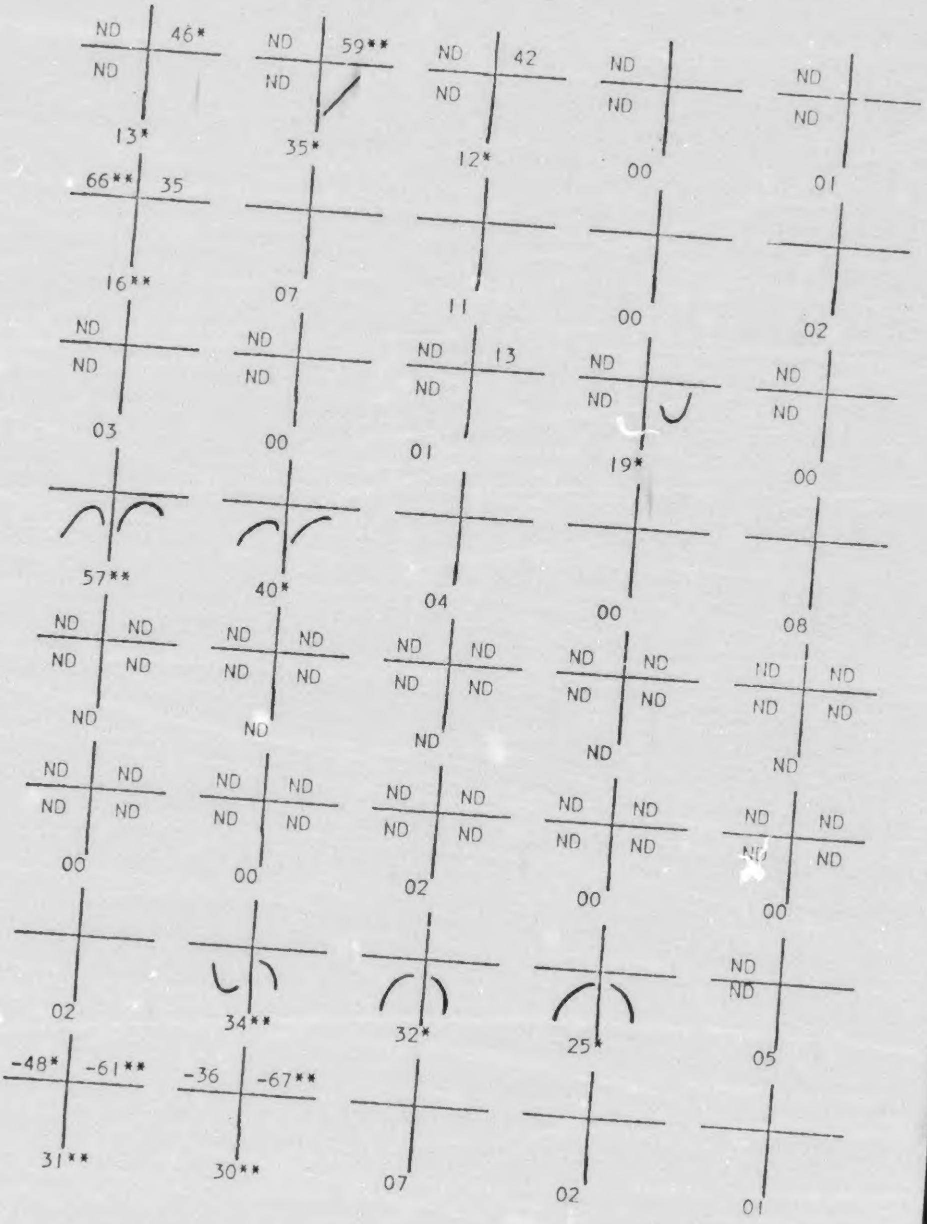
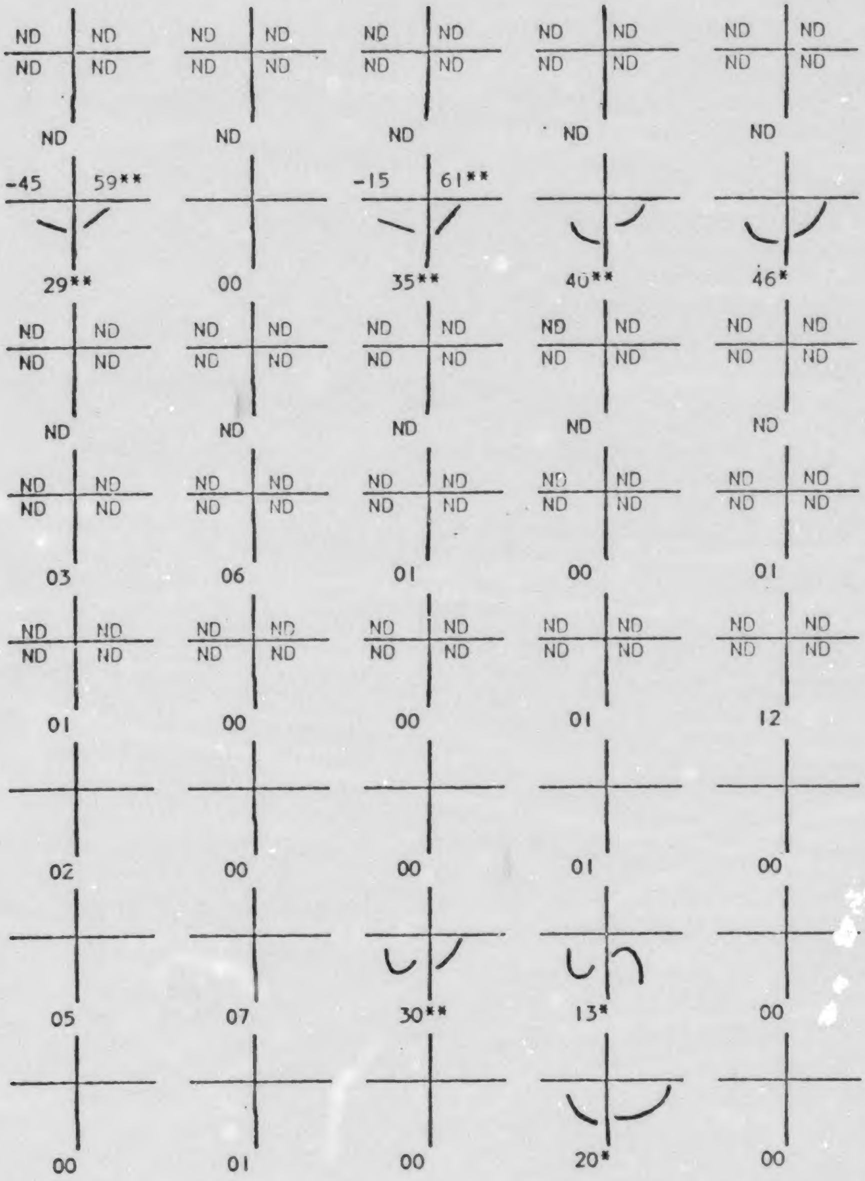


Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
25.	Repeats Question	ND ND 01	ND ND 25*	ND ND 06	ND ND 01	ND ND 01
		-68** -09 13*	10	26**	02	05
26.	Rephrases or Gives Clue	02	00	58* -21 00	00	ND ND 02
		03 -62** 22*	09	44 -53* 30**	01	00
27.	Asks New Question	-11 -51* 14*	07	33 -58** 31**	16 -49* 20*	ND ND 14
		ND ND 00	ND -48 ND 22**	ND ND 07	ND -56* ND 05	ND ND 54**
F.	Teacher Reactions to Wrong Answers					
28.	Praise	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND. ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 8 , Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
29.	Criticism	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		-45 59** 29**	00	-15 61** 35**	40**	46*
30.	Failure to Give Feedback	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND 03	ND ND ND ND 06	ND ND ND ND 01	ND ND ND ND 00	ND ND ND ND 01
31.	Process Feedback	ND ND ND ND 01	ND ND ND ND 00	ND ND ND ND 00	ND ND ND ND 01	ND ND ND ND 12
		02	00	00	01	00
32.	Gives the Answer	05	07	30**	13*	00
		00	01	00	20*	00

Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
33.	Calls on Someone Else	09	28 41 17**	-41 39 21*	01	-72* -00 00
		20 50* 14*	05	27*	08	01
34.	Another Student Calls Out the Answer	ND ND 01	-54** ND ND 08	ND ND 01	ND ND 03	ND ND 00
		32 ND ND 16**	ND ND 00	ND ND 07	ND ND 00	ND ND 00
35.	Repeats, Rephrases or Asks New Question	00	00	01	01	02
		08	-17 -50* 09	30**	02	01
36.	Repeats Question	09 -40 15*	01	-02 -47* 23*	30**	01
		-61** -26 19**	-40 -48* 16**	00	20**	00

Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
37.	Rephrases or Gives Clue	00	00	65** -19 / \ 18*	02	07
		00	00	01	02	00
38.	Asks New Question	01	00	02	48* -02 03	01
		ND ND 00	ND ND 01	ND ND 03	ND ND 03	ND ND 02
G.	Teacher Reactions to "I Don't Know" or No Response					
39.	Criticism	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
40.	Failure to Give Feedback	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND 03	ND ND ND ND 00	ND ND ND ND 01	ND ND ND ND 03	ND ND ND ND 01

Table 8, Cont'd.

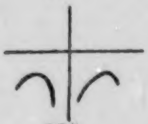
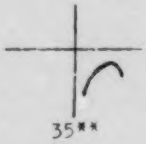
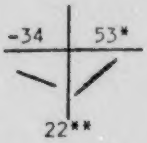
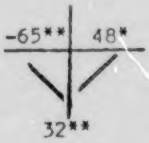
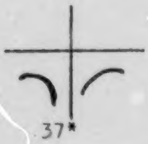
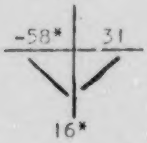
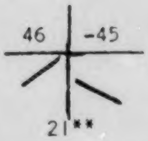
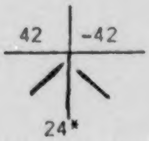
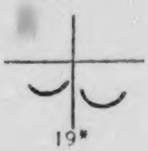
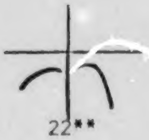
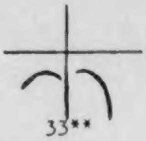
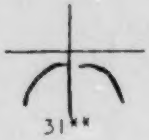
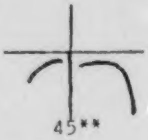
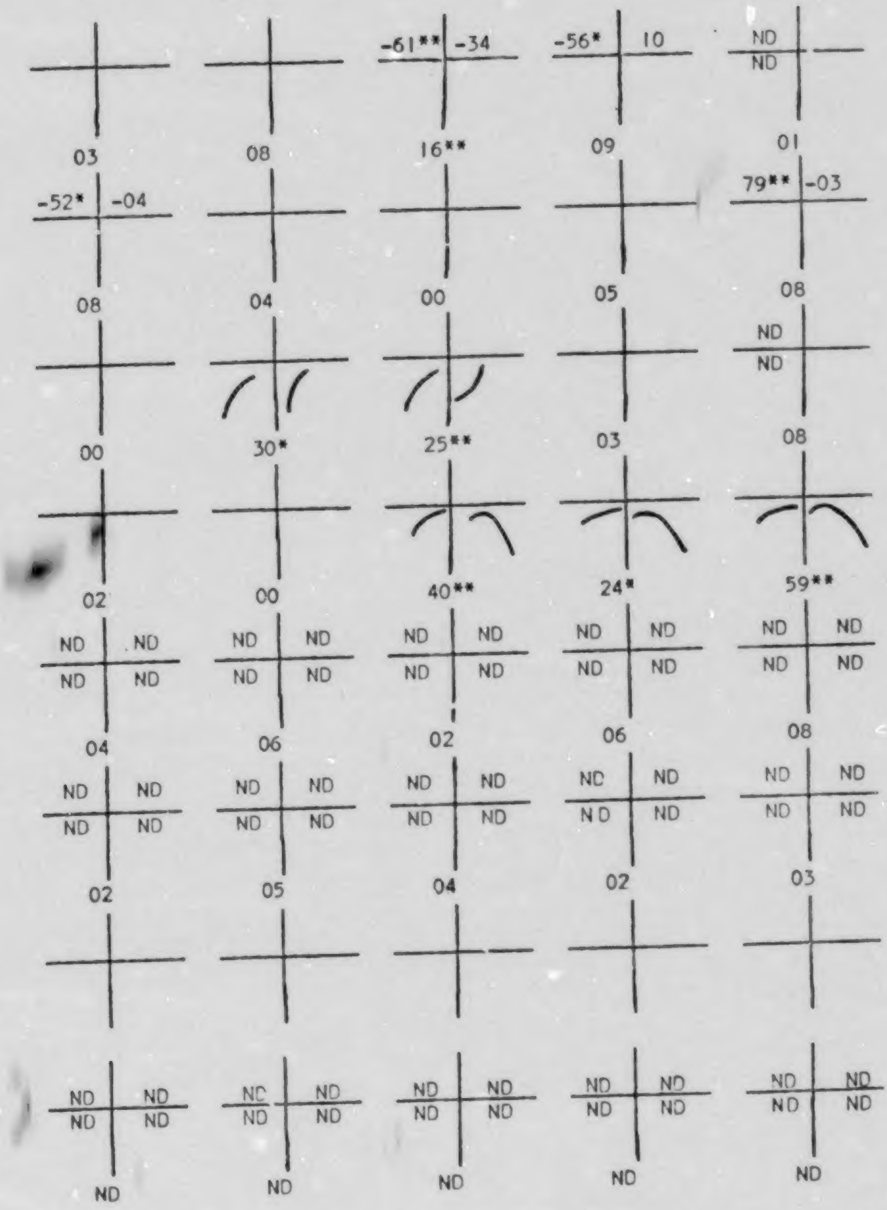
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
41.	Gives the Answer	ND ND ND ND 04	ND ND ND ND 02	ND ND ND ND 07	ND ND ND ND 02	ND ND ND ND 02
		03	04	00	03	00
42.	Calls on Someone Else	 25*	01	05	01	 35**
		 -34 53* 22**	01	 -65** 48* 32**	 37*	 -58* 31 16*
43.	Another Student Calls Out the Answer	ND ND ND ND 04	ND ND ND ND 00	ND ND ND ND 01	ND ND ND ND 03	ND ND ND ND 04
		 46 -45 21**	00	 42 -42 24*	00	 19*
44.	Repeats, Rephrases, or Asks New Question	00	00	08	00	ND ND 02
		 22**	 33**	00	 31**	 45**

Table 8, Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
45.	Repeats Question	03	08	-61** -34 16**	-56* 10 09	ND ND 01
		-52* -04 08	04	00	05	79** -03 08
46.	Rephrases or Gives Clue	00	30*	25**	03	ND ND 08
		02	00	40**	24*	59**
47.	Asks New Question	ND ND ND ND 04	ND ND ND ND 06	ND ND ND ND 02	ND ND ND ND 06	ND ND ND ND 08
		ND ND ND ND 02	ND ND ND ND 05	ND ND ND ND 04	ND ND ND ND 02	ND ND ND ND 03
H.	Teacher Reaction to DK					
48.	Criticism	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 8, Cont'd.

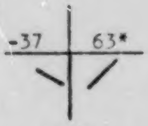
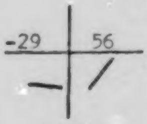
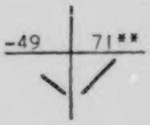
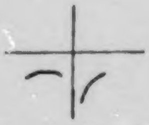
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
49.	Failure to Give Feedback	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
50.	Gives the Answer	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
51.	Calls on Someone Else	01	-37 63*  32**	-29 56  39**	-49 71**  33**	 62**
52.	Another Student Calls Out the Answer	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

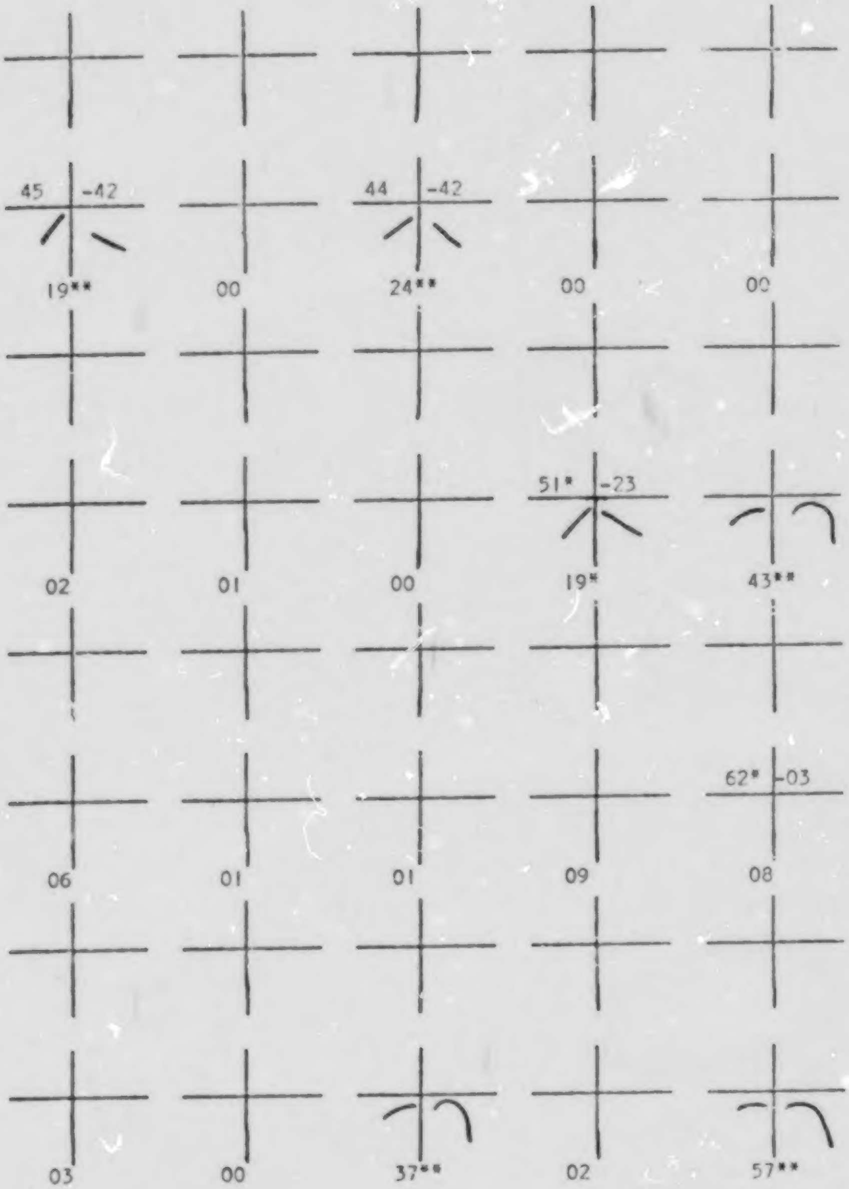
Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
53.	Repeats, Rephrases or Asks New Question	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
54.	Repeats Question	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
55.	Rephrases or Gives Clue	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
56.	Asks New Question	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
I.	Teacher Reaction to No Response					
57.	Criticism	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
58.	Failure to Give Feedback	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
59.	Gives the Answer	04	02	00	04	02
60.	Calls on Someone Else	29*	01	-75** 43 32**	-74** 31 38**	-71** 27 18*

Table 8, Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
61.	Another Student Calls Out the Answer	45 -42 19**	00	44 -42 24**	00	00
62.	Repeats, Rephrases or Asks New Question	02	01	00	51* -23 19*	43**
63.	Repeats Question	06	01	01	09	62* -03 08
64.	Rephrases or Gives Clue	03	00	37**	02	57**

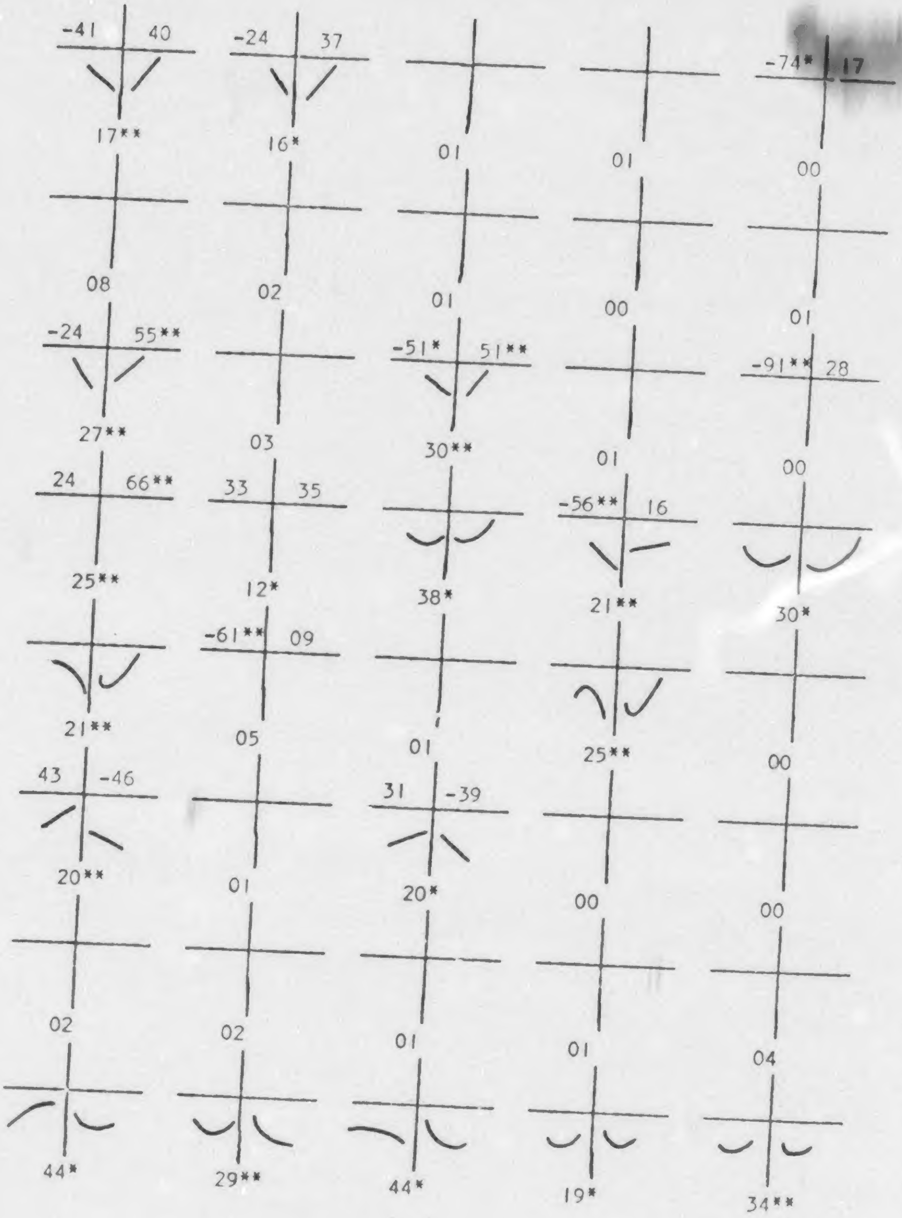
Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
65.	Asks New Question					
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
J.	Teacher Reactions Combined Across All Response Opportunities					
66.	Praise	01	01	04	00	02
		02	05	01	46 01 14*	01
66B.	Criticism After All Incorrect Answers					
		-44 73** 45**	-32 66** 34**	-19 63** 36**	01	-21 56** 32**
67.	Failure to Give Feedback	00	00	06	01	11
		52* -07 05	00	24*	01	00

Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
68.	Process Feedback	02	01	-06 44* 07	03	10
		-10 75** 32**	06	26 51* 27*	35 45 13*	34 52* 13
69.	New Question	01	00	34 -52** 27**	59** -31 29*	83** -28 02
		00	02	00	01	01
70.	Repeat, Rephrase or Asks New Question After Failure to Answer	03	03	17 -44* 08	02	81** 07 02
		-43 -51* 19**	-34 -68** 23**	02	01	01
71.	Repeats Question After Failure to Answer Correctly	02	07	-46 -25 12*	15*	00
		-56** 04 08	06	00	31**	07

Table 8, Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
72.	Gives the Answer After Failure to Answer Correctly	-41 40 17**	-24 37 16*	01	01	-74* 17 00
		08	02	01	00	01
73.	Calls on Another Student After Failure to Answer Correctly	-24 55** 27**	03	-51* 51** 30**	01	-91** 28 00
		24 66** 25**	33 35 12*	38*	-56** 16 21**	30*
74.	Another Student Calls Out Answer After Failure to Answer Correctly	21**	-61** 09 05	01	25**	00
		43 -46 20**	01	31 -39 20*	00	00
K.	Student Response Opportunities					
75.	Response Opportunities/ Total Teaching Time	02	02	01	01	04
		44*	29**	44*	19*	34**

Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
L.	Student Initiated Questions (SIQ's)					
76.	% SIQ's Irrelevant	/ ND / ND 03 ND / ND ND / ND 03	/ ND / ND 02 ND / ND ND / ND 02	/ ND ✓ / ND 43* ND / ND ND / ND 05	56 / ND / ND 14* ND / ND ND / ND 05	/ ND / ND 20 ND / ND ND / ND 08
77.	% SIQ's Called Out	ND / ND / 01 ND / ND / ⌒ 33**	ND / ND / 01 ND / ND / ⌒ 34**	ND / ND / 03 ND / ND / 05	ND / ND / 04 ND / ND / 05	ND / ND / 05 ND / ND / 03
78.	Praise of Question after Relevant SIQ's	ND / ND ND / ND ND ND / ND ND / ND ND	ND / ND ND / ND ND ND / ND ND / ND ND	ND / ND ND / ND ND ND / ND ND / ND ND	ND / ND ND / ND ND ND / ND ND / ND ND	ND / ND ND / ND ND ND / ND ND / ND ND
79.	Criticism of Question after Relevant SIQ's	ND / ND ND / ND ND ND / ND ND / ND ND	ND / ND ND / ND ND ND / ND ND / ND ND	ND / ND ND / ND ND ND / ND ND / ND ND	ND / ND ND / ND ND ND / ND ND / ND ND	ND / ND ND / ND ND ND / ND ND / ND ND

Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
80.	% Relevant SIQ's Given No Feedback					
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
81.	% Relevant SIQ's Delayed	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
82.	% Relevant SIQ's Not Accepted	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
83.	% Relevant SIQ's Given Brief Feedback	ND 60** ND 25**	ND 68** ND 34**	ND 77** ND 51**	ND 66** ND 27**	ND 66** ND 37**
		06	30**	00	09	02

Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
84.	% Relevant SIQ's Given Long Feedback	 ∪ ◡ 36*	 ╲ ╲ 53**	 ◡ ◟ 50*	18 -47* ╱ ╲ 19*	ND -49 ND 24*
		  06	 00	 00	56* 64** 33**	74* 00 11
85.	% Relevant SIQ's Redirected to Class	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
86.	Behavioral Praise of Relevant SIQ's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
87.	Behavioral Criticism of Relevant SIQ's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
88.	Behavioral Warning after Relevant SIQ's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
89.	Criticism of Question after Irrelevant SIQ's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
90.	% Irrelevant SIQ's Given No Feedback	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
91.	% Irrelevant SIQ's Delayed	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 8 , Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
92.	% Irrelevant SIQ's Given Brief Feedback	ND ND ND ND 12	ND ND ND ND 12	ND ND ND ND 22	ND ND ND ND 11	ND ND ND ND 38
		ND ND ND ND 27	ND ND ND ND 66*	ND ND ND ND 10	ND ND ND ND 04	ND ND ND ND 66*
93.	% Irrelevant SIQ's Given Long Feedback	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
94.	% Irrelevant SIQ's Not Accepted	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
95.	% Irrelevant SIQ's Redirected to Class	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
96.	Behavior Criticism after Irrelevant SIQ's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
97.	Behavioral Warning after Irrelevant SIQ's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
M.	Student Initiated Public Interactions					
98.	Student Initiated Comments and Questions/Total Response Opportunities	31*	01	00	00	01
		00	13 51* 08	02	52* 03 12*	07
N.	Student Initiated Comments (SIC's)					
99.	% SIC's Relevant	00	03	00	00	ND ND 01
		00	05	-66** 17 00	01	01

Table 8, Cont'd.

Number	Process Variable	Word Knowledge		Word Discrimination		Reading		Arithmetic Computation		Arithmetic Reasoning	
100.	% SIC's Called Out	ND		ND		ND		ND		ND	
		ND		ND		ND		ND		ND	
		00		22*		00		02		08	
		03		00		04		01		03	
101.	Praise of Comment after Relevant SIC's	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
		ND		ND		ND		ND		ND	
		ND		ND		ND		ND		ND	
		01		01		01		06		08	
102.	% Relevant SIC's Given No Feedback	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		00		02		00		02		04	
			ND		ND		ND	45	ND		ND
			ND		ND		ND		ND		ND
		03		00		02		15*		01	
103.	% Relevant SIC's Delayed	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	

Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
104.	% Relevant SIC's Not Accepted	ND ND 01	ND ND 00	ND 32 ND 12*	ND ND 06	ND ND 06
		40**	39**	01	01	06
105.	% Relevant SIC's Accepted	04	04	25*	-62** -38 20**	ND -64** ND 41**
		39 -65** 33**	56* -61** 37**	-02 -57** 32*	03	14*
106.	% Relevant SIC's Integrated into Discussion Topic	65** 23 10	05	00	00	ND ND 01
		02	00	03	00	01
107.	% Relevant SIC's Which Cause a Shift in Topic	ND ND ND ND 04	ND ND ND ND 07	ND ND ND ND 01	ND ND ND ND 07	ND ND ND ND 00
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
		ND | ND	ND | ND	ND | ND	ND | ND	ND | ND
		ND | ND	ND | ND	ND | ND	ND | ND	ND | ND
108.	Behavioral Praise after Relevant SIC's	ND	ND	ND	ND	ND
		ND | ND	ND | ND	ND | ND	ND | ND	ND | ND
		ND | ND	ND | ND	ND | ND	ND | ND	ND | ND
		ND	ND	ND	ND	ND
		ND | ND	ND | ND	ND | ND	ND | ND	ND | ND
		ND | ND	ND | ND	ND | ND	ND | ND	ND | ND
109.	Behavioral Criticism after Relevant SIC's	ND	ND	ND	ND	ND
		ND | ND	ND | ND	ND | ND	ND | ND	ND | ND
		ND | ND	ND | ND	ND | ND	ND | ND	ND | ND
		ND	ND	ND	ND	ND
		ND | ND	ND | ND	ND | ND	ND | ND	ND | ND
		ND | ND	ND | ND	ND | ND	ND | ND	ND | ND
110.	Behavioral Warning after Relevant SIC's	ND	ND	ND	ND	ND
		ND | ND	ND | ND	ND | ND	ND | ND	ND | ND
		ND | ND	ND | ND	ND | ND	ND | ND	ND | ND
		07	01	23**	16**	33**
		ND | ND	ND | ND	ND | ND	ND | ND	ND | ND
		ND | ND	ND | ND	ND | ND	ND | ND	ND | ND
111.	Praise of Comment after Irrelevant SIC's	ND	ND	ND	ND	ND
		ND | ND	ND | ND	ND | ND	ND | ND	ND | ND
		ND | ND	ND | ND	ND | ND	ND | ND	ND | ND
		ND	ND	ND	ND	ND

Table 8, Cont'd.

Number	Process Variable	Word Knowledge		Word Discrimination		Reading		Arithmetic Computation		Arithmetic Reasoning	
112.	% Irrelevant SIC's Given No Feedback	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
			ND		ND		ND		ND		ND
			ND		ND		ND		ND		ND
		13		00		03		04		06	
113.	% Irrelevant SIC's Delayed	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
114.	% Irrelevant SIC's Not Accepted	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		07		11		04		18		06	
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND		ND		ND		ND		ND	
115.	% Irrelevant SIC's Accepted	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
		04		01		01		00		00	
		48	46								
		22**		03		03		13		00	

Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
116.	% Irrelevant SIC's Integrated Into Discussion Topic	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
117.	% Irrelevant SIC's Which Cause a Shift in Topic	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
118.	Behavioral Praise after Irrelevant SIC's					
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
119.	Behavioral Criticism after Irrelevant SIC's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
120.	Behavioral Warning after Irrelevant SIC's	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
O.	Self and Opinion Questions					
121.	Self Questions/Process + Product + Choice Questions	⌒ ⌒ 14*	⌒ ⌒ 37**	01	00	01
		01	01	00	05	01
122.	% Self Questions Which Were Subject-Matter Related	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		03	09	01	00	00
123.	% Self Questions Related to Personal Preference	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		10	03	◡ ◡ 34**	-41 -38 15*	07 -60** 15*

Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
124.	Opinion Questions/ Process + Product + Choice Questions	02	02	03	05	03
		04	01	01	03	39 -43 18*
125.	% Opinion Questions Given No Response	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
126.	% Opinion Questions Followed by Praise	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		70** ND ND 33**	ND ND 00	60** ND ND 26**	ND ND 00	ND ND 00
127.	% Opinion Questions Criticized					
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
128.	% Opinion Questions Given No Feedback					
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
129.	% Opinion Questions Followed by Teacher Disagreement	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND 10	ND ND ND ND 19**	ND ND ND ND 38**	ND ND ND ND 05	ND ND ND ND 14
130.	% Student Opinions Accepted	ND ND ND ND 05	ND ND ND ND 15	ND ND ND ND 24**	ND ND ND ND 07	ND ND ND ND 11
		00	00	01	22*	00
131.	% Student Opinions Integrated Into Discussion Topic	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 8, Cont'd.

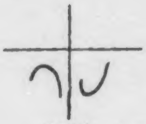
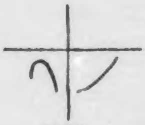
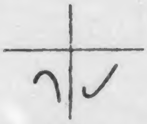
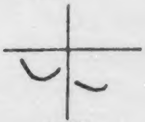
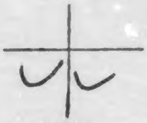
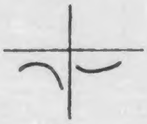
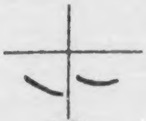
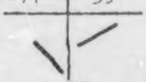
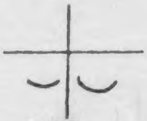
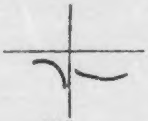
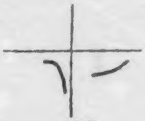
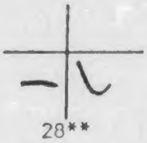
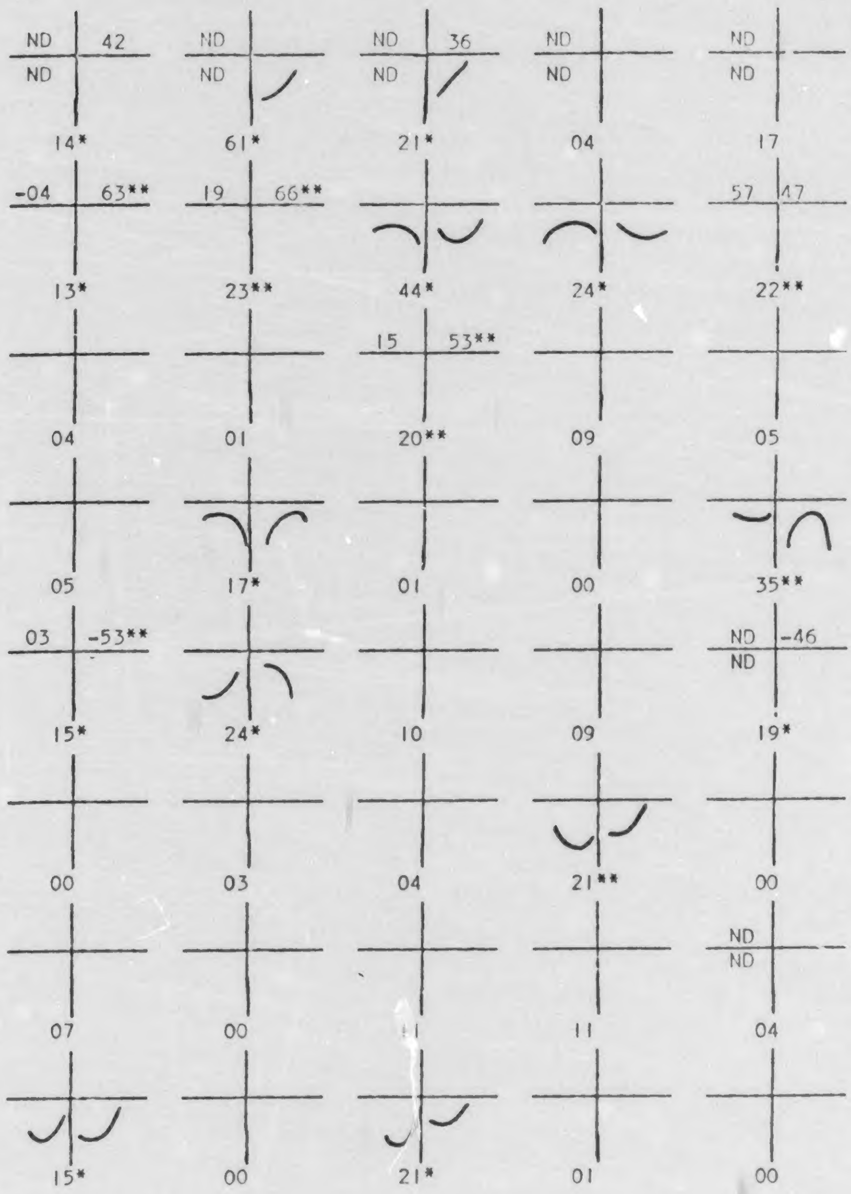
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
P.	Private Dyadic Contacts					
132.	% Private Contacts Student Initiated	 38**	 63**	07	 38**	15
		-49 -43 21**	00	05	01	01
133.	Student Initiated Work Contacts Involving Praise	ND ND ND ND 06	ND ND ND ND 00	ND ND ND ND 01	ND ND ND ND 07	ND ND ND ND 15
		 20**	01	 43**	 17*	00
134.	Student Initiated Work Contacts Involving Criticism	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		 58*	-71** 39  29**	 43*	 27*	 42**
135.	% Private Work Contacts Student Initiated	00	01	-10 46* 12*	04	ND ND 01
		01	01	 28**	00	01

Table 8, Cont'd.

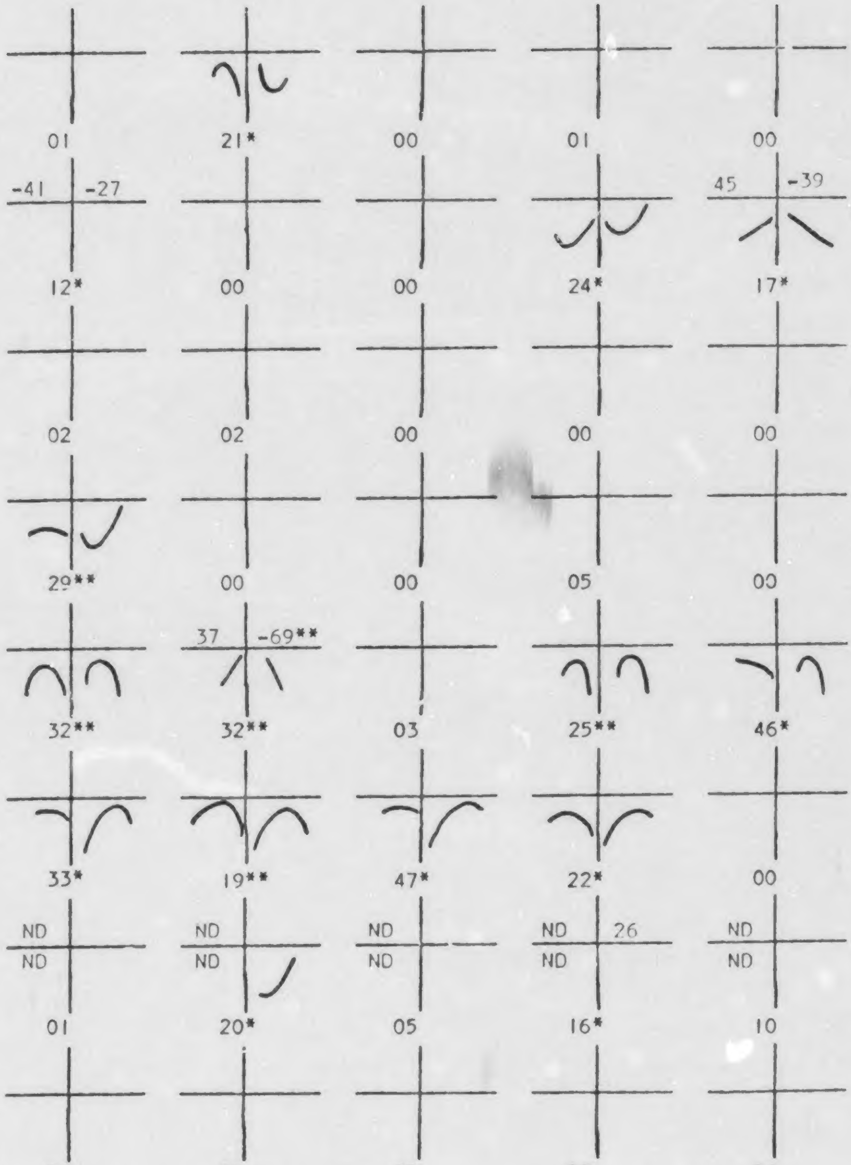


Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
136.	% Student Initiated Contacts Delayed	ND 42 ND 14*	ND ND 61*	ND 36 ND 21*	ND ND 04	ND ND 17
		-04 63** 13*	19 66** 23**	44*	24*	57 47 22**
137.	% Student Initiated Contacts Given Brief Feedback	04	01	15 53** 20**	09	05
		05	17*	01	00	35**
138	% Student Initiated Contacts Given Long Feedback	03 -53** 15*	24*	10	09	ND -46 ND 19*
		00	03	04	21**	00
139.	% Student Initiated Contacts Involving Personal Concerns	07	00	11	11	ND ND 04
		15*	00	21*	01	00

Table 8, Cont'd.

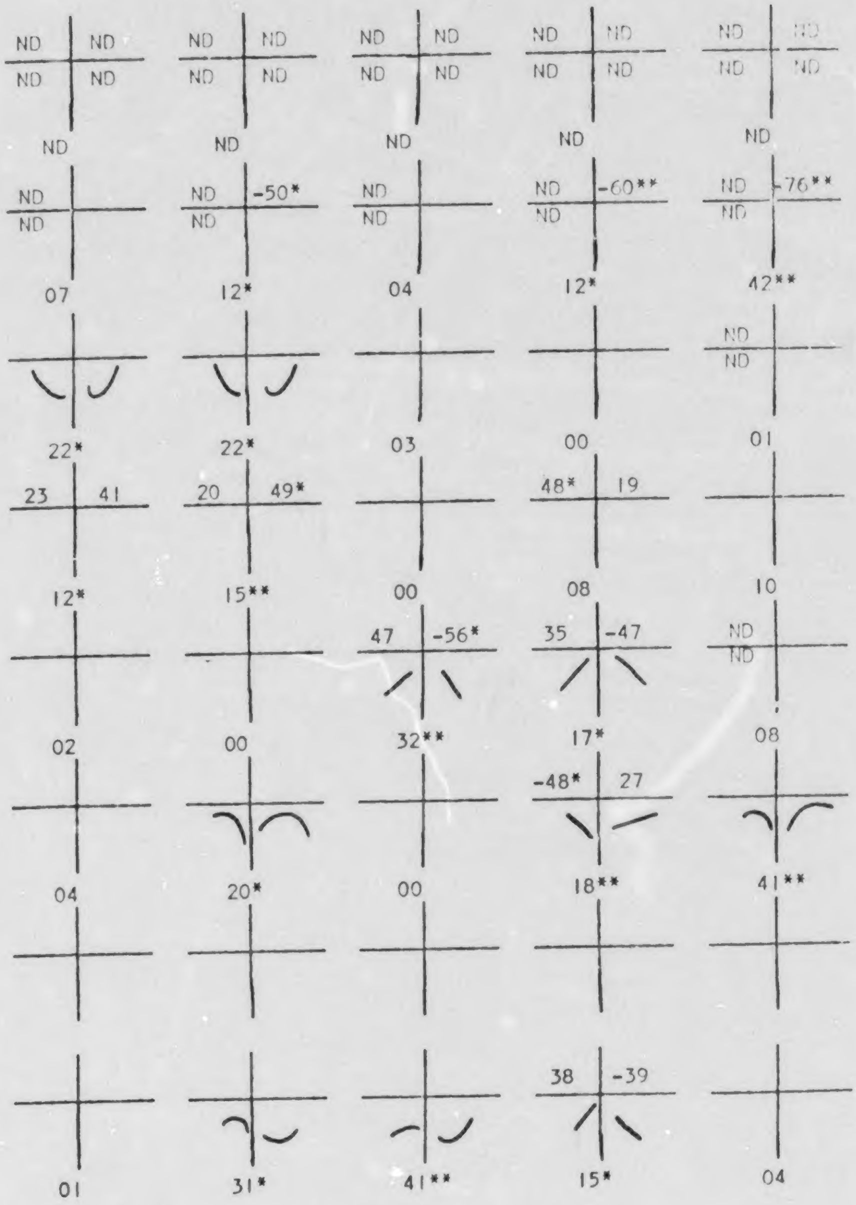
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
						ND ND
140.	% Student Initiated Requests Granted	00	00	00	00	04
			72** | 11		-71** | 29	ND ND
141.	% Student Initiated Requests Delayed	08	08	01	19*	15
		03	09	42**	39**	43*
			-40 | -43		-63* | -06	ND ND
142.	% Student Initiated Requests Not Granted	09	16*	02	00	00
143.	% Student Initiated Contacts Which Are Personal Experience Sharing					
		04	01	01	00	00

Table 8 Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
144.	Private Work Contacts/ Private Work Contacts + Public Response Opportunities	01	21*	00	01	00
		-41 -27 12*	00	00	24*	45 -39 17*
145.	Procedural Contacts/ Procedural Contacts + Response Opportunities	02	02	00	00	00
		29**	00	00	05	00
146.	Teacher Initiated Work Contacts/Teacher Initiated Work + Procedure Contacts	32**	37 -69** 32**	03	25**	46*
		33*	19**	47*	22*	00
147.	Teacher Initiated Work Contacts Involving Praise	ND ND 01	ND ND 20*	ND ND 05	ND 26 ND 16*	ND ND 10
		04	00	00	00	04

Table 8, Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
		ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND
148.	Teacher Initiated Work Contacts Involving Mere Observation	ND	ND	ND	ND	ND
		ND ND	ND -50* ND	ND ND	ND -60** ND	ND -76** ND
		07	12*	04	12*	42**
						ND ND
149.	Teacher Initiated Work Contacts Involving Brief Feedback	22*	22*	03	00	01
		23 41	20 49*		48* 19	
		12*	15**	00	08	10
				47 -56*	35 -47	ND ND
150.	Teacher Initiated Work Contacts Involving Long Feedback	02	00	32**	17*	08
					-48* 27	
		04	20*	00	18**	41**
151.	% Teacher Initiated Contacts Which are Personal Experience Sharing				38 -39	
		01	31*	41**	15*	04

Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
		ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND
152.	% Teacher Initiated Procedural Contacts Which Were Management Requests	07	04	00	00	05
		-52* 42	-57** -16			
		22**	08	04	00	00
			22 -51*			ND ND
153.	% Teacher Thanks Student for Doing a Favor Request	04	17*	20*	00	01
		ND 49 ND	ND ND	ND ND	ND ND	ND ND
		27**	00	01	03	04
						ND ND
154.	% Teacher Thanks Student Following a Management Request	03	01	02	00	05
					36 -67**	31 -50*
		22*	[illegible]9*	49**	26**	09
Q.	Combined Teacher Evaluation Statements					78* 21
155.	Academic Praise/ Academic Praise + Academic Criticism	05	02	04	21*	03
		45 -60*	40 -54*			
		29**	25**	06	28**	04

Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
156.	Behavioral Praise/ Total Behavioral Contacts	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND 04	ND -20 ND 25**	ND ND 00	ND ND 00	ND ND 00
157.	Behavioral Warnings/ Behavioral Warnings + Behavioral Criticism	ND ND 00	ND ND 00	ND ND 04	ND ND 01	ND 48 ND 20*
		  05	 01	-51* -09 04	 00	-39 -40 15*
R.	Discipline and Control Errors					
158.	% Discipline Contacts Involving One or More Error	ND ND ND ND 04	ND ND ND ND 00	ND ND ND ND 03	ND ND ND ND 00	ND ND ND ND 03
		  04	 01	 00	 04	 01
159.	Target Errors/ Total Errors	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
		ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
160.	Timing Errors/ Total Errors	ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND
		ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND
161.	Overreactions/ Total Errors	ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND	ND | ND ND | ND ND
		ND | ND | 15	ND | 55 ND | 38**	ND | 71 ND | 37**	ND | 92** ND | 23*	ND | 93** ND | 79**
162.	Nonverbal Control Contacts/Total Control Contacts.	ND | -37 ND | 13*	ND | ND | 07	ND | ND | 00	ND | -34 ND | 14*	ND | ND | 18
		10 | -59** | 20*	| | 06	| | 55**	| | 20*	| | 21*
S.	Combined Teacher Feedback Data					
163.	Repeat/Repeat + Rephrase + New Question	| | 01	| | 08	| | 07	| | 00	| | 01
		| | 38**	| | 30**	| | 43*	| | 00	| | 01

Table 8, Cont'd.

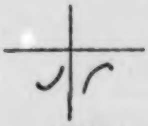
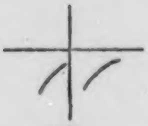
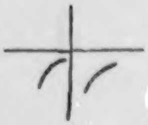
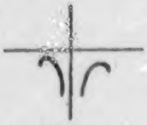
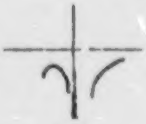
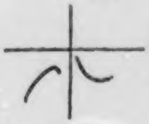
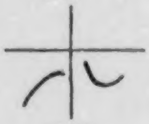
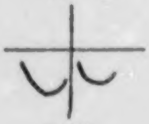
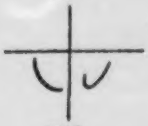
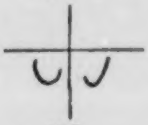
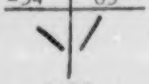
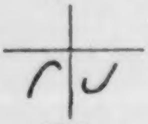
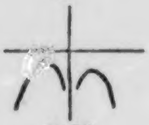
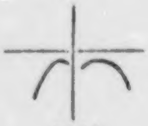
Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
164.	Rephrase/Repeat + Rephrase + New Question					
		44**	20*	19*	18*	35**
						
		36**	29**	34**	00	01
165.	Brief Feedback/ Brief + Long Feedback			-34 63** 		ND 52* ND
		33*	45*	36**	35**	16
						
		00	22**	00	02	28**
T.	Math Contacts					
166.	Total Public Math Contacts/Total Public Math Contacts + Total Private Math Contacts					
167.	Total Teacher Initiated Private Math Contacts/ Total Public Math Contacts + Total Private Math Contacts					

Table 8, Cont'd.

Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
168.	Total Teacher Afforded Math Contacts/Total Math Time					
169.	Total Math Response Opportunities/Total Math Time					
U.	Dyadic Contacts					
170.	Total Teacher Initiated Contacts/Total Teaching Time	01	00	00	58** -34 26**	77** -27 20*

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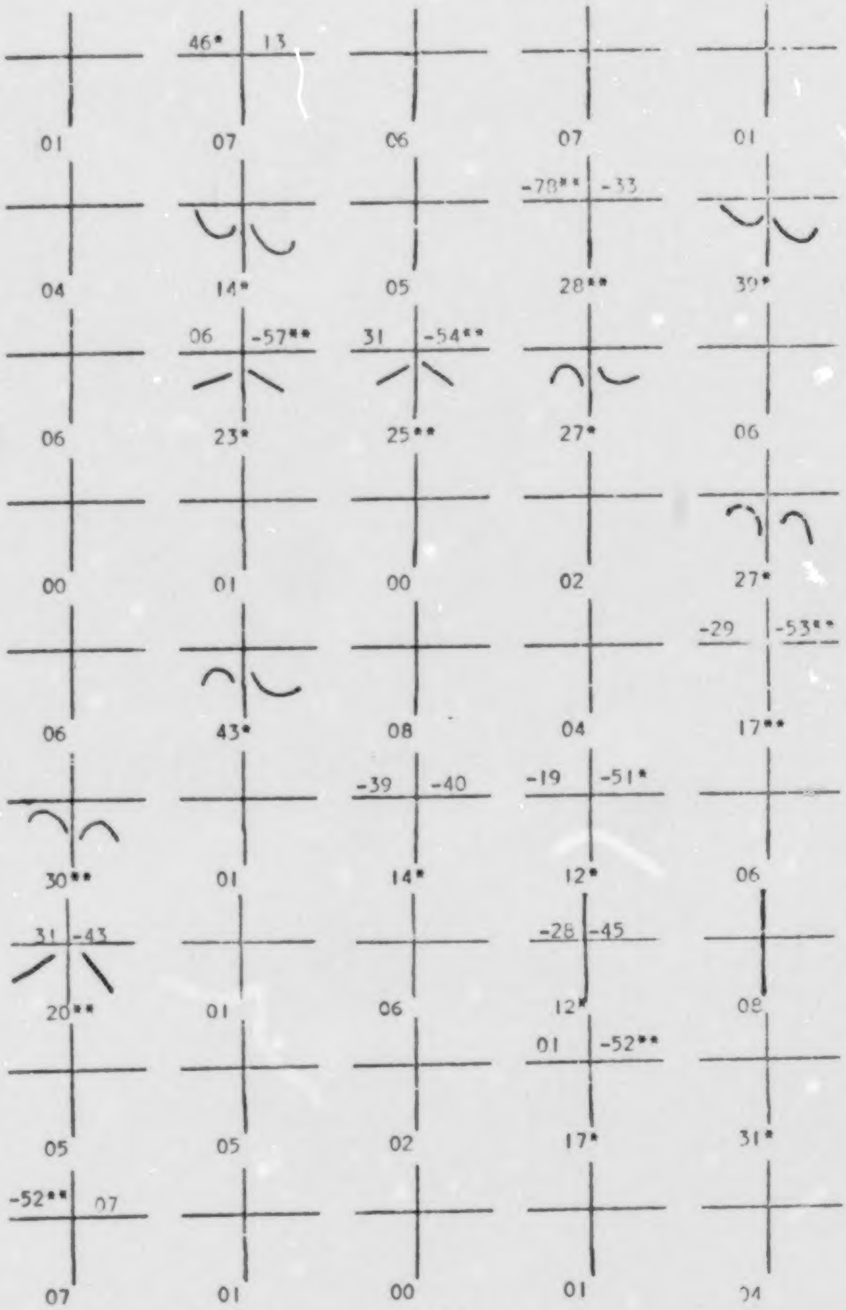
[1] Probability values are indicated by asterisks. One asterisk indicates a value of ≤.10. two asterisks indicate a value of ≤.05.

Table 9. Non-linear Presage-Product Relationships between Teacher Questionnaire Items and Student Residual Gain Scores (averaged across four years) on the Metropolitan Achievement Tests (decimal points omitted).[1]



Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
1.	High % of Objective Grading	01	46* 13 07	06	07	01
2.	Frequent Discipline Problems Due to Lack of Interest in Subject Matter	04	14*	05	-78** -33 28**	39*
3.	Teacher Stays at Her Desk High % of Time	06	06 -57** 23*	31 -54** 25**	27*	06
4.	High % of Lectures and Demonstrations	00	01	00	02	27*
5.	High % of Questions with One Correct Answer	06	43*	08	04	-29 -53** 17**
6.	High % of Errorless Performance Required for General Class Discussion	30**	01	-39 -40 14*	-19 -51* 12*	06
7.	Ideal Errorless Rate in Reading Groups	31 -43 20**	01	06	-28 -45 12*	08
8.	High % of Context, Whole Word Approach in Reading	05	05	02	01 -52** 17*	31*
9.	High % of Silent Reading in Reading Groups	-52** 07 07	01	00	01	04

Table 9, Cont'd.

Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning		
10.	High % of Individual Reading in Reading Group	◡ ◠ 23*	◡ ◠ 35**	04	02	◡ ◠ 31*		
11.	Allows Students to Call Out Comments	ND ND 03	ND ND 00	33 ND ND 10*	ND ND 10	ND ND 05		2 a
12.	Favors Social Promotion	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	d	d
13.	Takes Neatness Into Account for Grading Purposes	ND ND ND ND 04	ND ND ND ND 00	ND ND ND ND 01	ND ND ND ND 00	ND ND ND ND 01	d	a
14.	Washroom located Outside the Classroom	ND ND ND ND 10*	ND ND ND ND 12*	ND ND ND ND 14**	ND ND ND ND 30**	ND ND ND ND 23**	a	d
15.	Achievement Test Scores are More Valuable than Grades for Information about Students	01	01	03	00	00		
16.	Mark Only Absentees Instead of Calling Roll all Year	ND ND ND ND 00	ND ND ND ND 00	ND ND ND ND 03	ND ND ND ND 07	ND ND ND ND 00	d	d
17.	"Dresses up" a Lesson to Make It More interesting	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	a	a

Table 9, Cont'd.

Number	Presage Variable	Word Knowledge		Word Discrimination		Reading		Arithmetic Computation		Arithmetic Reasoning			
18.	Assigns Large Amount of Seatwork			60**	-19								
				/	\								
		02		18*		05		01		01			
19.	Assigns Large Amount of Homework	14	ND		ND	42	ND	-27	ND	-69**	ND		d
		—	ND		ND	—	ND	—	ND		ND		
	Believe Success Is Indicated By:	19**		07		24**		31**		12*			
20.	Class Is Well Behaved												
		08		02		06		03		05			
21.	Children Enjoy School	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	a	a
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
		ND		ND		ND		ND		ND			
22.	Children Work on Their Own	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	a	a
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
	Correct Seatwork By:	ND		ND		ND		ND		ND			
23.	Having Teacher Aide Do It	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	d	d
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
		ND		ND		ND		ND		ND			
24.	Doing It Yourself	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	d	d
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
		00		00		01		01		00			
25.	Having High Achievers Correct It	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	d	d
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
		ND		ND		ND		ND		ND			

Table 9 , Cont'd.

Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning	
26.	Having the Children Trade Papers	ND ND 01	ND ND 02	ND ND 02	ND ND 00	ND ND 00	d
27.	Going Over It Orally	01	01	08	02	00	
28.	Other Methods (Not Specified)	00	01	01	04	07	
	Preparation						
29.	Use Both Unit and Lesson Plans	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	a a
30.	Aim Instruction to Middle Achievers	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	a
31.	Aim Instruction to Low Achievers	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	d d
32.	Require Students to Stay on Lines Only for Printing and Writing Assignments	ND ND ND ND 01	ND ND ND ND 00	ND ND ND ND 04	ND ND ND ND 04	ND ND ND ND 05	d d
	Best Way to Include Parents Is:						
33.	In PTA and Projects	ND ND ND ND 04	ND ND ND ND 00	ND ND ND ND 02	ND ND ND ND 00	ND ND ND ND 00	a a
34.	To Cooperate with School by Disciplining Child at Home	ND ND 02	ND ND 00	ND ND 06	ND ND 07	ND ND 00	a

Table 9, Cont'd.

Number	Presage Variable	Word Knowledge		Word Discrimination		Reading		Arithmetic Computation		Arithmetic Reasoning			
35.	To Provide Warm, Positive Home Environment	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	a	a
		10*		02		01		04		14*			
36.	To Provide Enriching Materials at Home		ND		ND		ND		ND		ND		a
			ND		ND		ND		ND		ND		
		02		01		01		00		00			
37.	Conscious of Voice Quality Almost Always	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	a	a
		21**		12*		11*		07		29**			
38.	High Frequency of Severe Disruptions			10	49*			41	24				
		03		10*		04		12*		07			
39.	Publicly Praises a Child Frequently as Motivation to Others					49*	45*						
		04		00		17**		13**		05			
40.	Found Satisfactory Rapport with Students This Year		ND		ND		ND		ND		ND		
			ND		ND		ND		ND		ND		a
		04		00		03		06		01			
41.	Use Individual and Group Competition as Motivation	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		
		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	a	a
		10*		19**		04		03		09			
42.	High Number of Different Assignments on Any Given Day												
		00		23*		00		01		06			

Table 9, Cont'd.

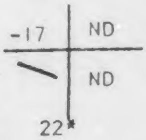
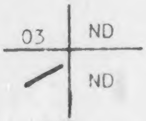
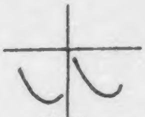
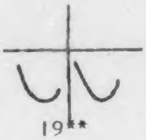
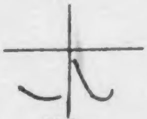
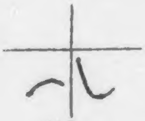
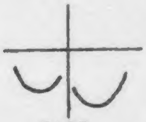
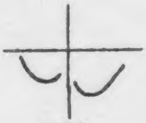
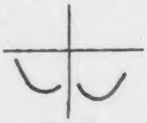
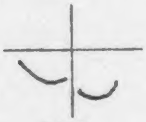
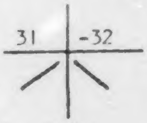
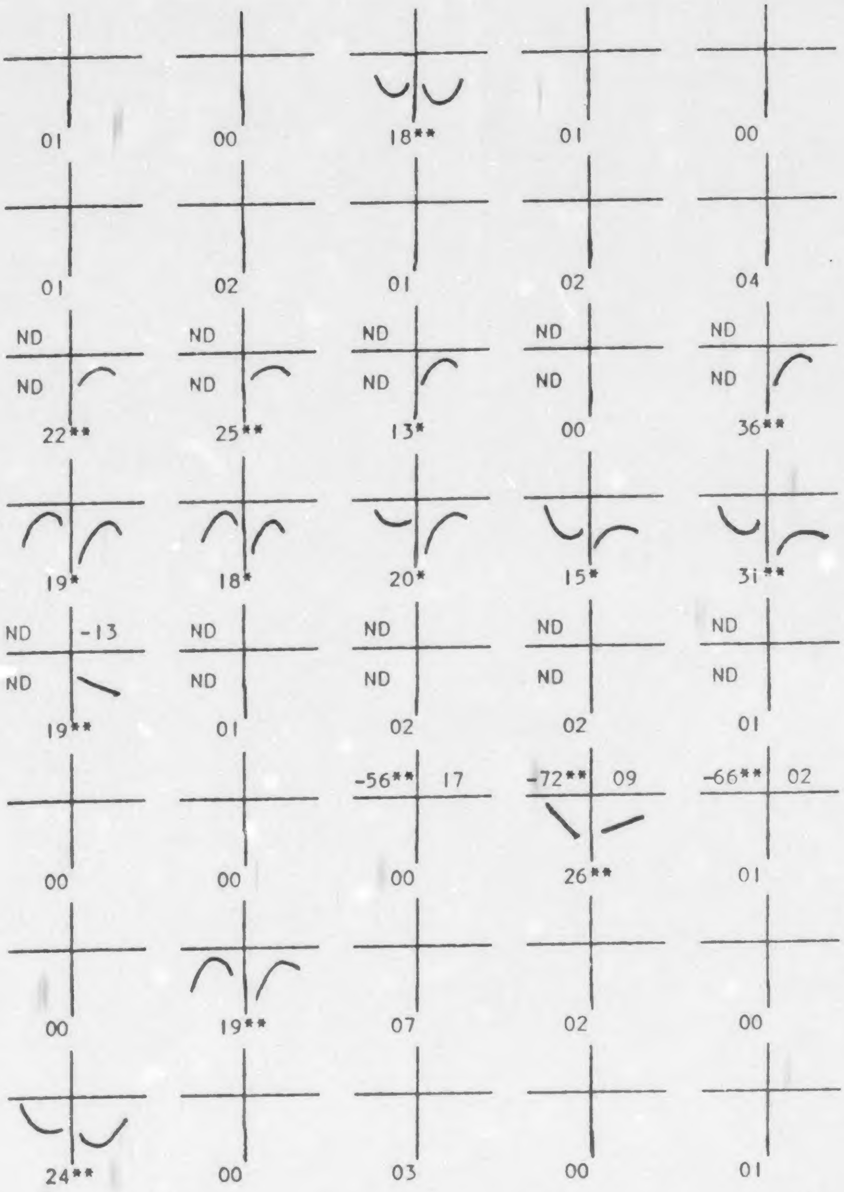
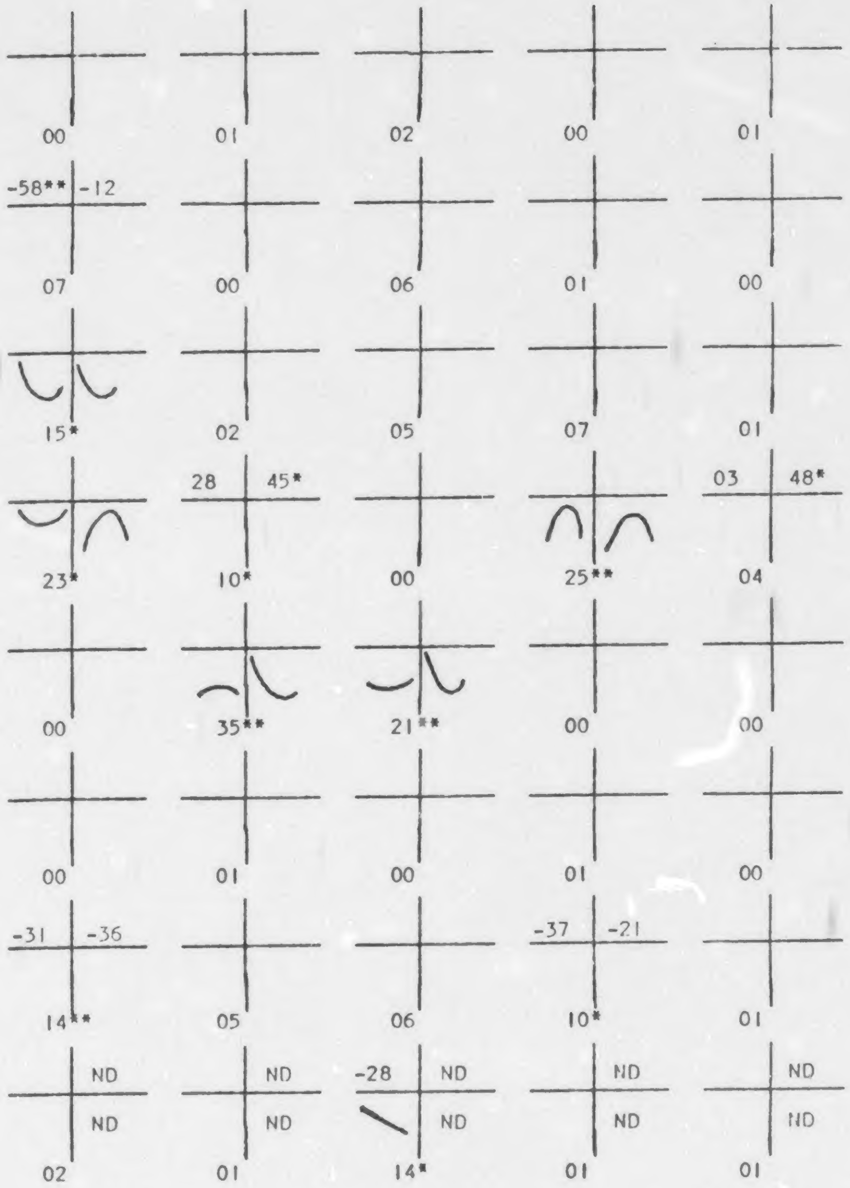
Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
43.	Frequently Has Students React to Other Students' Answers	02	52** 31 10*	02	03	03
44.	High # of Children Referred for Testing	00	00	00	04	00
	Regularly Uses the Following as Motivational Techniques:					
45.	Praise	 -17 ND ND 22*	ND ND 00	ND ND 11*	 03 ND ND 24*	25 ND ND 18**
46.	Smiling faces, Gold Stars	 24**	 19**	 27*	00	 31*
47.	Special Privileges	 51**	 24**	 49**	01	 34**
48.	Notes to Parents	02	04	01	04	00
49.	Written Comments On Papers	00	03	00	02	05
	Believes the Following Are Necessary for Good Teaching					
50.	Initiate, Direct, Administer	 31 -32 13*	02	00	01	01

Table 9, Cont'd.



Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning	
51.	Unify the Group	01	00	18**	01	00	
52.	Give Security	01	02	01	02	04	
53.	Diagnose Learning Problems	ND ND 22**	ND ND 25**	ND ND 13*	ND ND 00	ND ND 36**	a
54.	Make Curriculum Materials	19*	18*	20*	15*	31**	
55.	Evaluate, Record, and Report	ND -13 ND 19**	ND ND 01	ND ND 02	ND ND 02	ND ND 01	a
56.	Expose Children to Enriching Community Activity	00	00	-56** 17 00	-72** 09 26**	-66** 02 01	
57.	Participate in School Activities	00	19**	07	02	00	
58.	Participate in Professional and Civic Life	24**	00	03	00	01	

Table 9, Cont'd.



Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
59.	Develop Curiosity and Creativity	00	01	02	00	01
60.	Involve Students in Ugly or Distressful Aspects of Subject	-58** -12 07	00	06	01	00
61.	Quickly Tell Students Whether Answers are Correct or Incorrect	15*	02	05	07	01
62.	Encourage Tackling Hard Problems	23*	28 45* 10*	00	25**	03 48* 04
63.	Give Exact Instructions on Each Task	00	35**	21**	00	00
64.	Provide Exact Model for Student's Work	00	01	00	01	00
65.	Engage Students in Drama and Music	-31 -36 14**	05	06	-37 -21 10*	01
66.	Engage in Peer Tutoring	ND ND 02	ND ND 01	-28 ND ND 14*	ND ND 01	ND ND 01

Table 9, Cont'd.

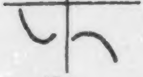
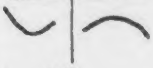
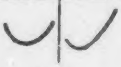
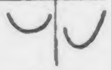
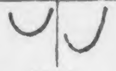
Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning	
67.	Patience	ND ND ND ND 01	ND ND ND ND 01	ND ND ND ND 00	ND ND ND ND 04	ND ND ND ND 01	a
68.	Knowledge of Subject Matter	ND ND ND ND 03	ND ND ND ND 16**	ND ND ND ND 00	ND ND ND ND 05	ND ND ND ND 04	a a
69.	Frequent Praise	01	06	-71** 15 01	-69** -13 18**	-63* 04 05	
70.	Prepare Students for Metropolitan and Stanford Tests	 42*	05	-45 -32 11*	-33 42 15**	-23 -58** 26**	
71.	Use Slang With Students	03	03	04	01	00	
72.	Arrange Attractive Bulletin Boards	08	01	01	 20*	03	
73.	Develop Good Rapport with Children	09	07	03	06	04	
74.	Be Involved in Out-of-School Problems	03	03	 24**	 23**	 38**	

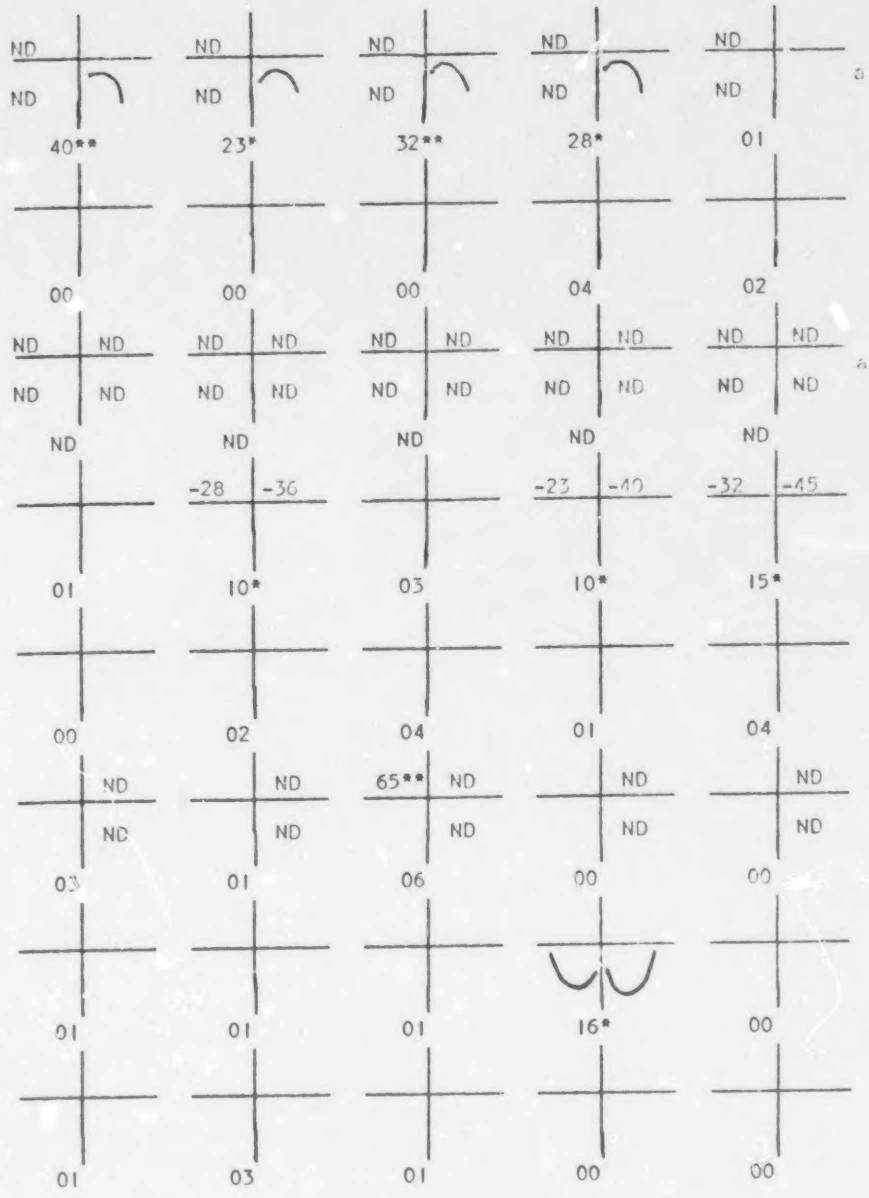
Table 9, Cont'd.

Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
75.	See That Students Supplies at Desk	01	00	00	02	01
	Gain High Satisfaction From:					
76.	Vacations and Free Time	00	01	01	00	00
77.	Working with Books and Ideas	ND ND 02	ND ND 01	ND 49* ND 12*	ND 48* ND 12*	ND 62** ND 28** [a]
78.	Working with Other Teachers	00	00	07	00	00
79.	Non-teaching Duties	03	00	03	02	-40 47* 27*
80.	Salary and Benefits	ND ND 01	ND ND 01	ND ND 00	ND ND 00	ND ND 00 [a]
	Always Do the Following When Presenting Seatwork:					
81.	Present New Material	01	00	00	01	-58* 19 00
82.	Summarize New Material	00	00	00	03	21*

Table 9, Cont'd.

Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
83.	Practice	01	00	00	-34 -27 10*	-58* -15 07
84.	Show Students Mistakes and Have Them Correct Them	00	00	08	02	00
85.	Give Directions for Follow-up Seatwork	00	-32 36 15*	-45* 39 16**	01	-57* 35 22*
86.	Allow Independent Seatwork	00	03	04	00	02
87.	High Number of Times Whole Class Lines Up	00	26*	22**	03	02
	Following Items Are Most Important for Assigning Grades					
88.	Effort	00	00	18*	00	02
89.	Success or Failure in Assigned Work	02	03	04	35**	07
	Importance for Deciding About Student:					
90.	Standardized Achievement Tests	00	00	00	00	00

Table 9, Cont'd.



Number	Process Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
91.	Teacher-Made Tests	ND ND 40**	ND ND 23*	ND ND 32**	ND ND 28*	ND ND 01
92.	Seatwork & Homework	00	00	00	04	02
93.	Observations About Student	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
	Frequent Use of Following Teacher Resources					
94.	Learning Centers without A/V Aids	01	-28 -36 10*	03	-23 -40 10*	-32 -45 15*
95.	Student Teachers	00	02	04	01	04
	Consider Following Serious Teacher Problems					
96.	Wide Range of Student Achievement	ND ND 03	ND ND 01	65** ND ND 06	ND ND 00	ND ND 00
97.	Nature & Quality of Instructional Materials	01	01	01	16*	00
98.	Rapid Rate of Curriculum Change	01	03	01	00	00

Table 9, Cont'd.

Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning	
	Require More Help From:						
99.	Secretarial or Clerical Staff	06	02	08	22*	15 -46* 07	
	Need More Time to:						
100.	Develop New Programs	-51** 08 02	00	00	03	03	
101.	Plan Daily Activities	02	02	-27 41 15*	24**	-50 33 20*	
102.	Work with Fellow Teachers	01	01	00	01	00	
103.	Relax and Think	ND ND 26*	ND ND 00	ND ND 31**	ND ND 44**	ND ND 08	a
	Concerning Opinions About Teaching and its Methods and Goals; Teachers Identify the Following as Important						
104.	Best to Use Pointer with Blackboard	ND ND ND ND 00	ND ND ND ND 00	ND ND ND ND 01	ND ND ND ND 01	ND ND ND ND 04	a a
105.	Grading is One of Most Important Functions of Teacher	ND ND ND ND 07	ND ND ND ND 10*	ND ND ND ND 03	ND ND ND ND 00	ND ND ND ND 00	d d
106.	School Learning Should be Acquisition of Specified Content	00	01	00	00	01	

Table 9, Cont'd.

Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
107.	Avoid Competition in Front of Whole Class	01	-50* | -12 08	00	-59** | 21 20**	-60* | -00 03
108.	Facts Come Before Generalizations	ND | ND | 00	ND | ND | 00	ND | ND | 00	ND | ND | 00	ND | ND | a 01
109.	Good Teacher Admits Ignorance Openly	ND | ND | 36*	ND | ND | 04	ND | 54** ND | 24*	ND | 75** ND | 38**	ND | 59** ND | a 35**
110.	Do Not Enter Grades While Kids Recite	22**	00	01	01	03
111.	Math is as Easy to Learn as Any Other Subject	45* | -14 00	53** | 12 06	00	01	28**
112.	Use Difficult Words to Help Students Learn them	ND | ND ND | ND 00	ND | ND ND | ND 00	ND | ND ND | ND 00	ND | ND ND | ND 00	ND | ND a ND | ND 00
113.	Punishment for Poor Work is Repetition	-30 | -41 15**	06	-49* | -32 12*	-56** | -21 12*	04
114.	Authority Can be an Obstacle to Those Who Want to Learn	00	01	06	01	00

Table 9, Cont'd.

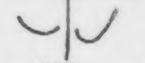
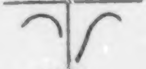
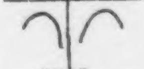
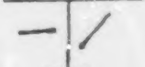
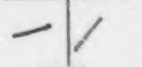
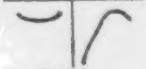
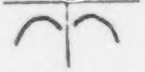
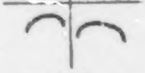
Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
115.	Gear Teaching to City-Wide Tests	-38 -28 13*	03	02	03	1[illegible]
116.	Teacher's Personality Is More Important than Methods Used	-48* 19 00	00	 20*	-04 50* 08	07
117.	Not Necessary to Repeat or Rephrase When Introducing New Concept	ND ND ND ND 01	ND ND ND ND 00	ND ND ND ND 01	ND ND ND ND 01	ND ND ND ND 00
118.	Learning by Memorizing, or Copying May Deter Problem Solving Ability	ND ND 07	ND ND 08	ND ND 00	ND ND 01	ND ND 02
119.	Effective Teaching Requires Teacher to Know Backgroud of Student	 46**	 30**	04 65**  35**	05 77**  35**	 71**
120.	Giving Right Answers Is Less Effective Than Guidance in Problem Solving	ND ND ND ND 08	ND ND ND ND 01	ND ND ND ND 07	ND ND ND ND 02	ND ND ND ND 12*
121.	Without Proper Training, Mental Abilities Remain Undeveloped	07	01	02	 28*	 41**
122.	Encourage Student to Disagree With Teachers' Statements	ND ND ND ND 04	ND ND ND ND 00	ND ND ND ND 00	ND ND ND ND 00	ND ND ND ND 00

Table V, Cont'd.

Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
123.	Teacher's Main Job is Intellectual Training For Students	27*	00	06	35**	-39 -33 12*
124.	Some Students Ask Too Many Questions	00	01	18*	20**	00
125.	Small Group Discussions Are Important	ND ND 18*	ND ND 21**	ND ND 00	ND ND 00	ND ND 00
126.	Problem Solving is One of Main Purposes Of Schooling	ND -55** ND 25*	ND ND 01	ND -35 ND 19**	ND -37 ND 23**	ND -51* ND 33**
127.	Good Teacher Avoids Doing Student's Work for Him	ND ND ND ND 01	ND ND ND ND 01	ND ND ND ND 03	ND ND ND ND 04	ND ND ND ND 00
128.	Natural & Healthy For Kid to Resist Teacher	-39 44* 22**	04	33**	28 54** 18**	35 57** 25**
129.	Teacher Should Talk To Kid as to Adult	00	02	-44* 40 17**	-09 61** 23**	07
130.	Waste of Time for Kids To Discuss Work Among Themselves	ND ND ND ND 04	ND ND ND ND 08	ND ND ND ND 00	ND ND ND ND 01	ND ND ND ND 01

Table 9, Cont'd.

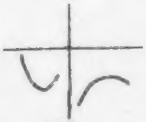
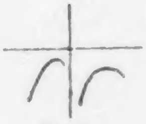
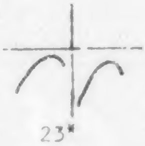
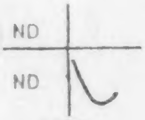
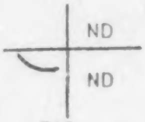
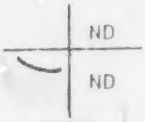
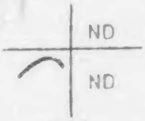
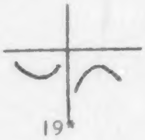
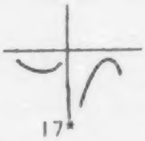
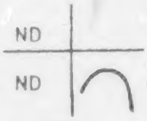
Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
131.	Good Teacher Lets Kids Do the Work	 16*	01	02	 21**	 23*
132.	Only Important Thing to Teach is Principle	ND -55** ND 20**	ND  ND 20**	ND ND 02	ND ND 03	ND ND 15*
133.	Promotion Should be Based on Academic Achievement	ND ND ND ND 25**	ND ND ND ND 05	ND ND ND ND 12*	ND ND ND ND 01	ND ND ND ND 02
134.	Explanation Should Be Short to Retain Interest	 ND ND 31*	-45* ND ND 04	ND ND 08	 ND ND 31**	 ND ND 33**
135.	Peer Tutoring is Good	 19*	 17*	01	01	03
136.	Tell or Explain Nothing Student Can Get Alone	ND ND 04	ND ND 02	ND ND 06	ND ND 00	ND ND 00 a
137.	Assign Material Then Insure Students' Work	ND -49* ND 11*	ND ND 05	ND ND 04	ND ND 05	ND  ND 27*
138.	Kids Should Master Material Whether or Not Interesting	ND ND 06	ND ND 00	ND ND 00	ND ND 00	ND ND 00

Table 9, Cont'd.

Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
139.	Strong Emphasis Should Be Put on Mastery of Subject Matter and Memorization of Facts	01	00	01	05	03
140.	Important Function is to Acquire Knowledge Basic to Satisfying Family Life	-07 -50* 15**	02	-24 -44* 16*	06	-22 -39 12*
141.	Advance Organizers Are Important	ND ND 04	ND ND 01	ND ND 16*	ND ND 00	ND ND 00
142.	Teacher Should Ask Frequently If Students Understand	ND ND 20*	ND ND 00	61** ND ND 05	48* ND ND 05	ND ND 00
143.	Some Review Is Good Everyday	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
144.	Allow Students to Choose Assignments Instead of Making One Assignment for All	ND ND 01	ND ND 05	ND ND 21**	ND ND 01	ND ND 00
145.	A Teacher Should Discourage Students From Moving Around the Room Freely	64** -17 00	00	00	-15 35 17**	01
146.	Directive Teaching Produces More Passive Student	ND ND 06	ND ND 03	ND ND 04	ND ND 02	-56 ND ND 17*
147.	Ignore Mistakes to Avoid Interruption	ND ND 06	ND ND 03	ND ND 00	ND ND 00	ND ND 02

Table 9, Cont'd.

Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning	
148.	Encourage Kids to Believe They Can Succeed	ND ND 06	ND -46* ND 20**	ND -45* ND 14**	ND -22 ND 12*	ND -35 ND 14*	a
149.	Memory Assignments Should be Frequent	00	03	00	04	00	
50.	Often Ignore Students Who Continually Raise Their Hands	-05 58** — / 27**	01	33 60** 22**	04 73** — / 32**	04 68** — / 43**	
151.	Show Students Purpose of Work	ND ND 01	ND ND 00	ND ND 04	ND ND 02	ND ND 01	a
152.	"Practice Makes Perfect" Sums up Learning	06	01	06	05	07	
153.	Praise in Some Way All Kids' Work	ND ND 02	ND ND 06	ND ND 01	ND ND 00	ND ND 03	a
154.	Require Same Amount Of Work From All Students	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	d d
155.	Don't Allow Deviation from Instruction	ND ND ND ND 01	ND ND ND ND 03	ND ND ND ND 07	ND ND ND ND 06	ND ND ND ND 00	d d

Table 9, Cont'd.

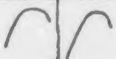
Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning		
156.	Good Text Is Storehouse of Facts	ND ND 00	ND ND 02	ND ND 00	ND ND 00	ND ND 00	a	
157.	Teach Students How to Learn Effectively	ND ND ND ND 01	ND ND ND ND 01	ND ND ND ND 01	ND ND ND ND 01	ND ND ND ND 06	a	a
158.	Good Teacher Needs to Spend Little Time on Clarification	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	d	d
159.	Students Should Stand While Reciting	ND ND ND ND 01	ND ND ND ND 00	ND ND ND ND 07	ND ND ND ND 04	ND ND ND ND 03	d	d
160.	Most Visual Aids Are Not as Good As Printed Word	ND ND 03	ND ND 00	ND ND 01	ND ND 01	ND ND 04	d	
161.	Effective Learning Comes From Logically Organized Text	ND ND 02	ND ND 00	-50* ND ND 03	ND ND 04	ND ND 02	d	
162.	Teachers Who Rely Heavily on Texts Are Not as Effective	00	00	00	01	00		
163.	Teachers Should Be Wrong Sometimes	04	 19**	10	06	05		

Table 9, Cont'd.

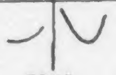
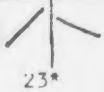
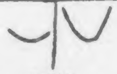
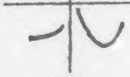
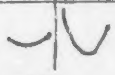
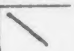
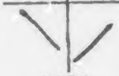
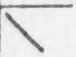
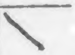
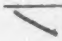
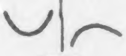
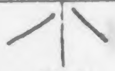
Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning	
164.	Teacher's Primary Job Is Explaining Subject Matter	 30**	75** -10  23*	 28**	 35**	 44*	
165.	Remind Kids To Ask When They Don't Understand	ND -36 ND 20**	ND -20 ND 10*	ND ND 00	ND -51** ND  18*	ND -58** ND 32**	a
166.	No Specific Rules For Effective Teaching	01	-57** 34  21**	00	05	06	
167.	Routine Can Adversely Affect Learning	ND -53** ND  24**	ND ND 00	ND -50* ND  22*	ND ND 00	ND ND 00	d
168.	Teaching Should Be Evaluated Independent of Learning Results	-55** ND ND 02	-42 ND  ND 23**	ND ND 01	ND ND 00	ND ND 00	d
169.	Without Practical Usefulness Knowledge Is Without Value	-58** -16 12*	 27**	00	03	02	
170.	Teaching Techniques Must Be Adapted to Individual Students	00	00	02	27 -55**  22**	05	
171.	Impact of Teacher is Far More Important Than Rest of School Environment	ND ND ND ND 12*	ND ND ND ND 12*	ND ND ND ND 00	ND ND ND ND 01	ND ND ND ND 05	a a

Table 9, Cont'd.

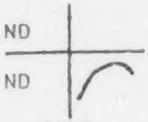
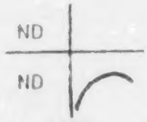
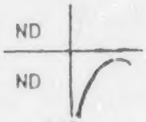
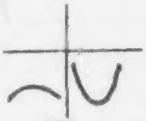
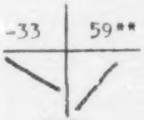
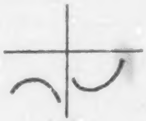
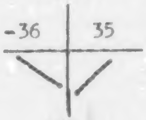
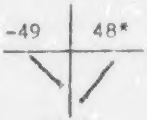
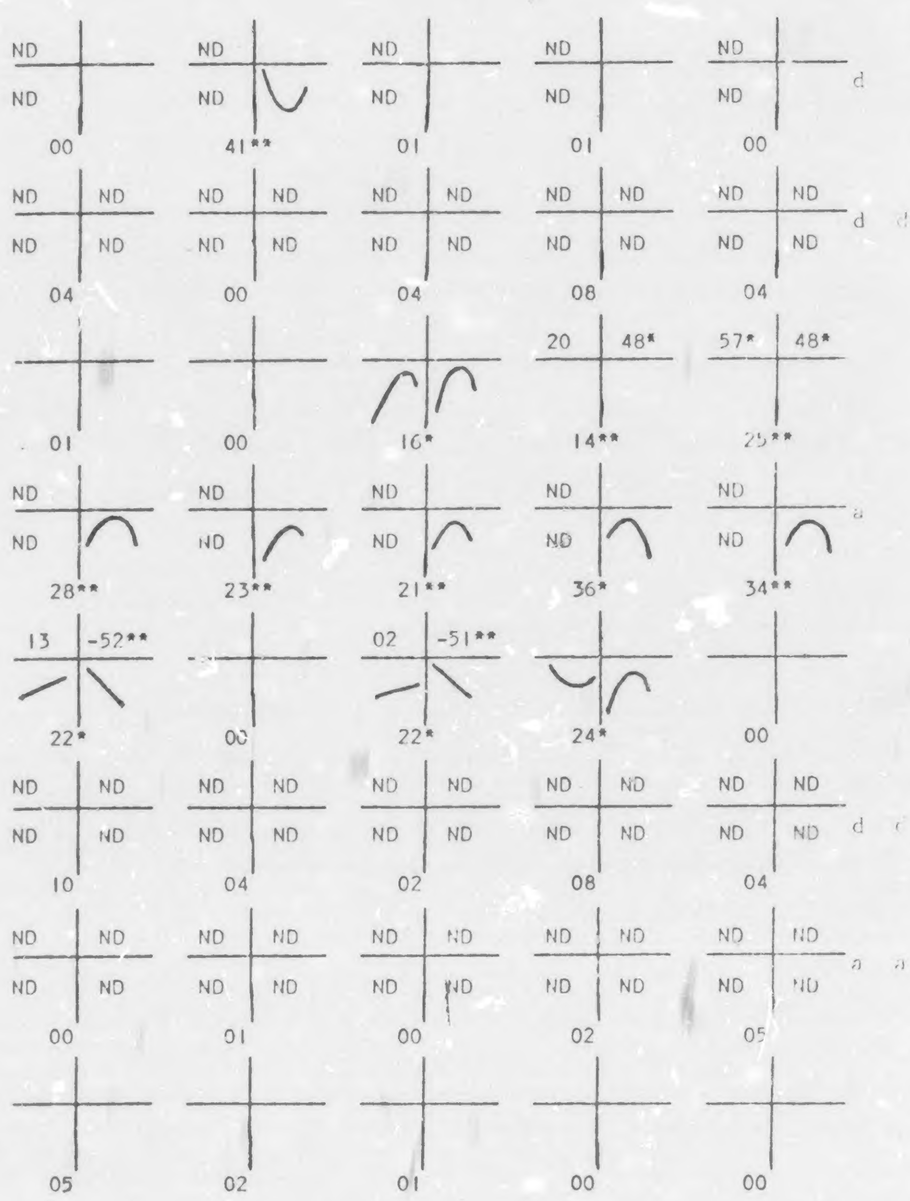
Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning	
172.	In Most Classes, Students Should Be Ability Grouped	-35 ND ND 19**	-38 ND ND 14**	ND ND 03	ND ND 08	-47 ND ND 22**	a
173.	Teachers Should Use Some of Students' Lingo	00	01	00	00	00	
174.	Good Teaching and General Affection Are Separate	ND ND 01	ND ND 05	ND ND 03	ND ND 02	ND ND 00	d
175.	Teacher Should Reward Effort and Penalize Lack of It Regardless of Mastery Achieved	04	04	01	00	01	
176.	Teacher Should Avoid Use of Slang	ND ND 02	ND ND 02	ND ND 01	ND ND 04	ND ND 03	a
177.	Good Teacher Never Uses Compulsion	-51** -22 12*	-48* -22 12*	01	03	-60* -12 09	
178.	In Average Classroom of 20+, Its Unnecessary to Know Individual Students Well	 ND ND 26**	ND ND 00	ND ND 00	 ND ND 41**	 ND ND 54*	d
179.	Objective Exams Are Not Good; No Original Ideas	 37*	 -33 59** 29**	 41*	 -36 35 16*	 -49 48* 30**	

Table 9, Cont'd.



Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning	
180.	Student Should Repeat Grammar Construction Until Correct	ND ND 00	ND ND 41**	ND ND 01	ND ND 01	ND ND 00	d
181.	Relevancy Will Not Help Disinterested Student	ND ND ND ND 04	ND ND ND ND 00	ND ND ND ND 04	ND ND ND ND 08	ND ND ND ND 04	d d
182.	Important to Make Definite Rules About Good Teaching	01	00	16*	20 48* 14**	57* 48* 25**	
183.	Teacher Should Be Expected to Spend Some Free Time With Student If It Will Help Them Learn	ND ND 28**	ND ND 23**	ND ND 21**	ND ND 36*	ND ND 34**	a
184.	Unrealistic That Student Get Along Without Teachers	13 -52** 22*	00	02 -51** 22*	24*	00	
185.	Good Teaching Implies Much Teacher Talk	ND ND ND ND 10	ND ND ND ND 04	ND ND ND ND 02	ND ND ND ND 08	ND ND ND ND 04	d d
186.	Teaching Should Proceed On Principle That Intellectual Learning Is Pleasurable	ND ND ND ND 00	ND ND ND ND 01	ND ND ND ND 00	ND ND ND ND 02	ND ND ND ND 05	a a
187.	Usually Teacher's Fault When Student Does Not Understand Assignment	05	02	01	00	00	

Table 9, Cont'd.

Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning	
188.	One Should Not Do A Lot of Oral Evaluating of A Student's Work	ND ND 01	ND ND 02	-52** ND ND 12*	-52** ND ND 03	ND ND 00	d
189.	Insight Into Nature of Our Number System Will Not Reduce Amount of Drill Necessary	06	01	03	00	00	
190.	All Except Exceptional Student Should Acquire Same Knowledge and Skills At Same Time	ND ND ND ND 02	ND ND ND ND 05	ND ND ND ND 01	ND ND ND ND 00	ND ND ND ND 00	d d
191.	Praising Others Does Little to Stimulate Achievement	ND ND 08	ND ND 00	ND ND 03	ND ND 00	ND ND 02	d
192.	Teaching is An Art Not a Science	ND 50* ND 11*	ND ND 01	ND 57** ND 18**	ND ND 07	ND 46* ND 24**	a
193.	Teacher Should Check To See If Explanation Has Left Some Students Puzzled	ND ND ND ND 04	ND ND ND ND 01	ND ND ND ND 02	ND ND ND ND 00	ND ND ND ND 00	a a
194.	Agree That If Instruction is Clear Few Discipline Problems Occur	02	01	23*	35**	-54 -31 14*	
195.	Disagree That Nonachievers Should Be Failed	ND -48* ND 10*	ND ND 04	ND -50* ND 27**	ND ND 00	ND ND 03	a

Table 9, Cont'd.

Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
196.	Lecture Method is Seldom Desirable	ND ND 00	ND ND 00	-38 ND ND 11*	ND ND 02	-66* ND ND 06
197.	Competition in "Bees" Are Desirable Learning Activity	06	24*	31*	-46* 55** 28**	44*
198.	Maximum Learning Occurs When Teacher and Student Have a Definite Idea of What Is To Be Done	ND ND ND ND 02	ND ND ND ND 01	ND ND ND ND 01	ND ND ND ND 00	ND ND ND ND 00
199.	Better to Err In Underexplaining Than Overexplaining	ND ND 02	ND ND 01	ND ND 00	ND ND 00	ND ND 00
	Extremely Concerned With:					
200.	The Nature and Quality Of Instructional Materials	30**	04	-57** -30 13**	06	04
201.	Frustration With Routine and Inflexibility of Situation	-28 64** 30**	-28 54** 24**	30 55** 28*	27 56** 14**	07 73** 46**
202.	Becoming Too Personally Involved With Students	21**	01	00	01	02
203.	The Wide Range of Student Achievement	02	00	08	03	06

Table 9, Cont'd.

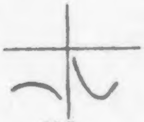
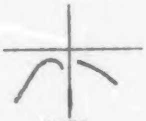
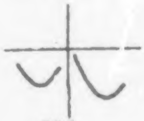
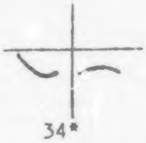
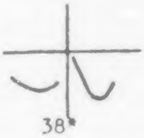
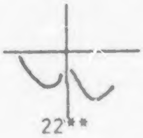
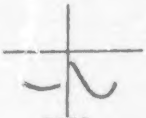
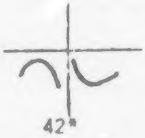
Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
204.	Diagnosing Student Learning Problems	08	 29*	-20 -51** 14**	-25 -35 11*	10
205.	Too Many Noninstructional Duties	00	02	01	 32**	04
206.	Insuring That Students Grasp Subject Matter Fundamentals	00	 20*	03	04	02
207.	Working With Too Many Students Each Day	05	03	03	-04 -47* 08	 34*
208.	The Values and Attitudes of Current Generaltion	00	00	08	01	02
209.	Understanding the Philosophy of the School	 38*	 22**	 36**	02	00
210.	Students Who Disrupt Class	00	00	00	 42*	01
211.	Student Use of Drugs	-07 -52* 10*	-50* -09 07	06	-74** -04 18**	-79** -15 10

Table 7, Cont'd.

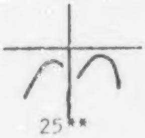
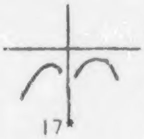
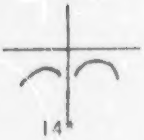
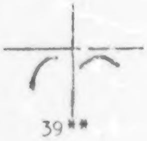
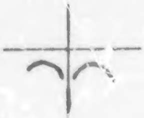
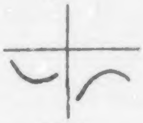
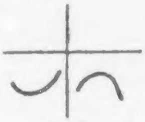
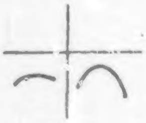
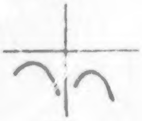
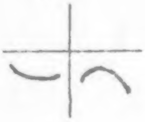
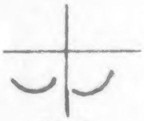
Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
212.	Whether Each Student Is Getting What He Needs	 25**	 17*	01	 14*	 39**
213.	Emotional and Social Needs of Students	04	03	-07 -39 10*	 25*	-65** -22 04
214.	The Wide Diversity of Student Ethnic and Socioeconomic background	03	 27**	00	00	00
215.	Motivate by Using Public Rewards	03	25 52** 18**	27 35 10*	40 45* 19**	43 41 15*
216.	Believe in Good Organization of Materials and Procedures	07	01	00	07	13
217.	Focus on Careful Instructional Organization and Systematic Teaching Methods	01	00	00	00	04
218.	Emphasize Good Classroom Control	 26**	00	 30*	 17*	 34*
219.	Believe in the Importance of Individualizing Student Learning	01	01	08	 24**	00

Table 9, Cont'd.

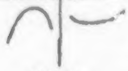
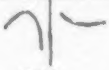
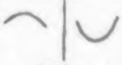
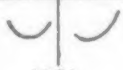
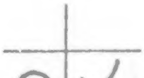
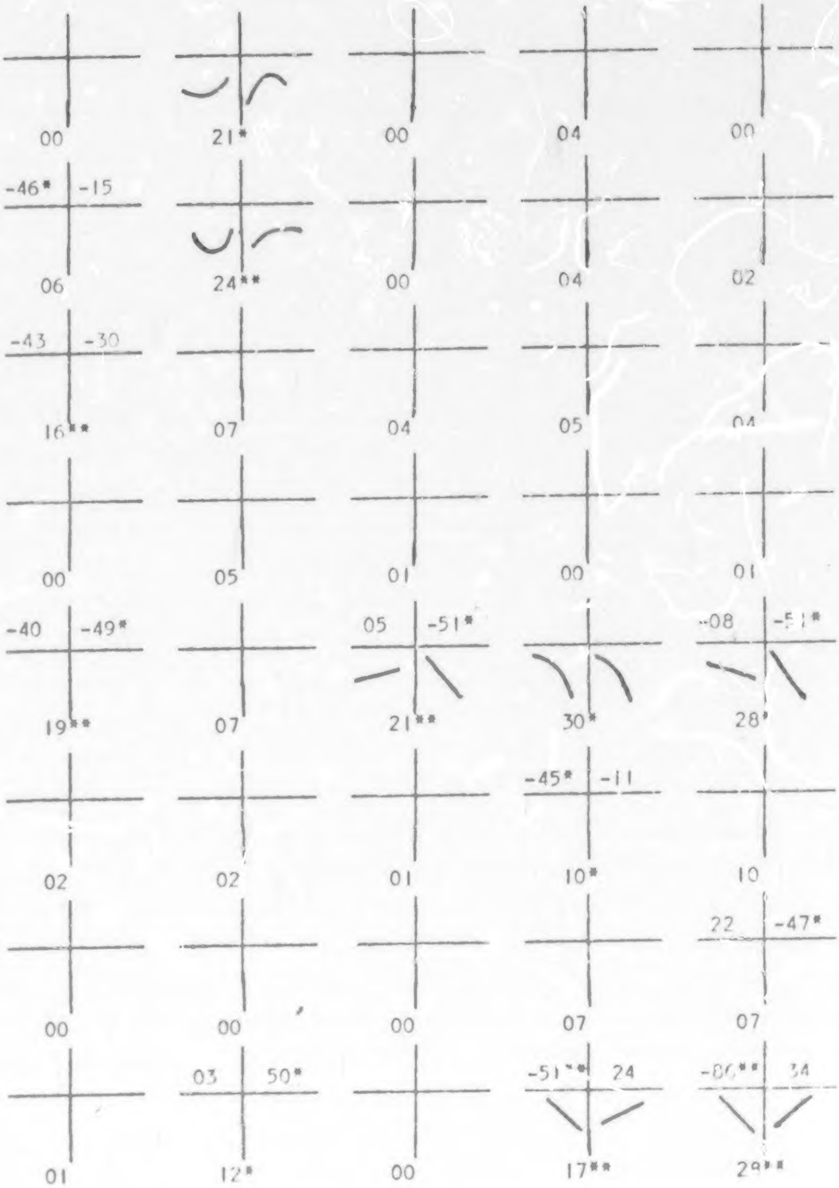
Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
220.	Believe in the Importance of Organizing and Motivating	 20**	 21*	00	-47* -20 10*	-65** 07 01
221.	Believe in the Importance of Affective Aspects of Teaching	 16*	02	01	03	00
222.	Gains Satisfaction from Working with People	-30* [illegible] 01	00	00	00	01
223.	Gains Satisfaction from Intellectual Stimulation and Public Recognition	07	00	01	00	01
224.	Gains Satisfaction from Dedication to Difficult Teaching Problems	 25**	02	22 47* 12*	07	16 50* 22**
225.	Academic Grades do Much to Encourage Students	03	38 22 10*	00	08	11
226.	Gains Satisfaction from Constructing and Marking Homework and Tests	00	02	03	04	02
227.	Exams are Good Devices to Help the Teacher Evaluate Student Learning	-56** -22 13*	-44* 06 03	 20**	01	00

Table 9, Cont'd.

Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
228.	IQ Is Important in Teaching and Evaluating Students	03	00	29**	60** 26 16**	02
229.	Tests Should be Used to Improve Teaching, Not to Evaluate Students	04	00	01	-29 34 12*	-10 58** 34*
230.	The School Is Not as Responsive to Student Needs as It Should Be	00	00	01	00	00
231.	Curriculum and Academic Materials are Inappropriate but Unavoidable	00	00	00	02	02
232.	Teachers Need More Help From Others so They Can Have More Time with Students	03	00	01	00	00
233.	Concerned with Doing Job Well and Being Liked by Students for It	00	00	00	00	03
234.	Concerned with Getting Along with Children and School Personnel	02	01	04	-31 -26 10*	02
235.	Concerned with Providing Individualized and Reality-based Instruction	02	00	03	04	01

Table 9, Cont'd.



Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
236.	Concerned with Guiding Students and Providing Stable Emotional and Intellectual Climate	00	21*	00	04	00
237.	Concerned with Physical Limitations in Terms of Time and Materials	-46* -15 06	24**	00	04	02
238.	Concerned About Being Favorably Evaluated for Doing a Good Job	-43 -30 16**	07	04	05	04
239.	Feels it is Necessary to Teach Particular Facts	00	05	01	00	01
240.	Class is Centered Around Student Input	-40 -49* 19**	07	05 -51* 21**	30*	-08 -51* 28*
241.	Lessons are Flexible and Open to Academic Student Input	02	02	01	-45* -11 10*	10
242.	It's Important to Sum and Review Lessons to Make Sure Everybody Understands	00	00	00	07	22 -47* 07
243.	Teach Facts Rather than More Global Concepts	01	03 50* 12*	00	-51** 24 17**	-86** 34 29**

Table 9, Cont'd.

Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
244.	Prefers lecture or Explanation to Multi-media Presentation	32**	-55** 16 15*	30**	33**	30*
245.	Teacher Alone Should Determine Subject Matter and Methods	00	00	02	00	00
246.	Involve Parents Directly in Classroom	34 -36 17*	44* -28 15*	01	02	01
247.	Prefer to Bring Resources Into Class Rather Than Take Children Out of Class	00	00	00	03	00
248.	Use A-V Aids	00	00	01	01	04
249.	Use Visitors from Community	00	29 -34 13*	03	03	01
250.	Competition is Desirable	00	03	01	01	00
251.	Elaborate Planning and Preparation is Not Necessary	03	-13 56** 24**	27**	06	05

Table 9, Cont'd.

Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
252.	Plan Daily for Each Subject	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
253.	Teaching to Individuals Rather Than to Subgroups	01	00	00	10*	11
254.	Emphasis on Class As a Whole Rather Than Individuals	02	02	01	01	02
255.	Pressure to Achieve and Emphasis on Academic Mastery is Beneficial	23 -47* 20*	01	05	02	07
256.	Lessons Should Not Be Flexible	32**	00	32**	39**	36**
257.	Learning Is Easy for Most (But Not All) Students	28 -53** 25**	40 -59** 30**	-27 -52** 24*	37*	41*
258.	Humor and Interesting Subject Matter are Important Ingredients of Teaching	08	-31 -41 14*	01	04	07
259.	Believe Students Will Work On Their Own and Establish Their Individual Level	-60** -35 20**	02	05	05	04

Table 9, Cont'd.

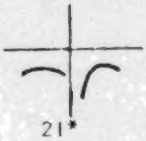
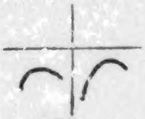
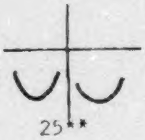
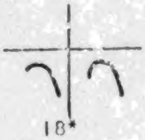
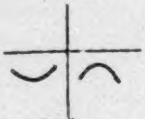
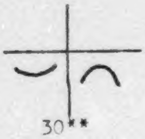
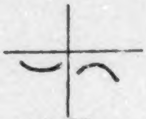
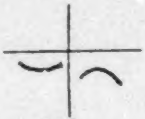
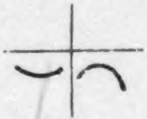
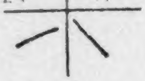
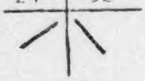
Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
260.	Personal and Social Growth is More Important Than Academic Growth	03	01	00	00	00
261.	Emphasize Discipline and Academic Work	03	04	53** -14 01	07	04
262.	Teachers Should Make Lessons Interesting	00	00	01	 21*	 23*
263.	Learning is More Important than Attitudes and Happiness of Students	08	 25**	01	 18*	01
264.	Learning Should be Interesting, Not Laborious	00	06	00	01	01
265.	Measure Success by Class Work Habits and Success in Teaching Slower Children	 26*	 30**	 44**	 28*	 36*
266.	Measure Success Through Student's Understanding	24 -47*  21**	24 -52**  22**	-20 -46* 13**	01	-03 -53** 09
267.	Drill and Excessive Problem-solving is Beneficial in Teaching Math Well	55** 06 05	52** 29 13*	00	03	03

Table 9, Cont'd.

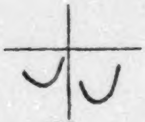
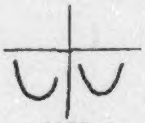
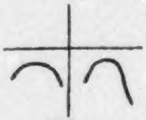
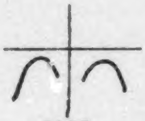
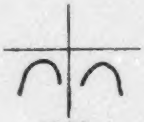
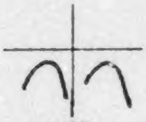
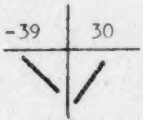
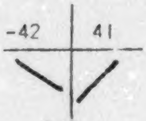
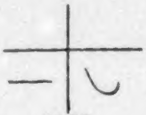
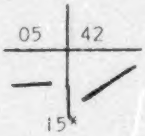
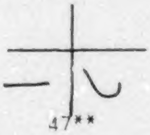
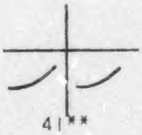
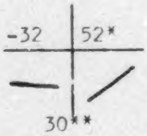
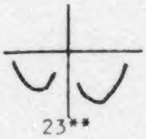
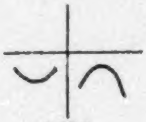
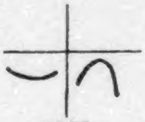
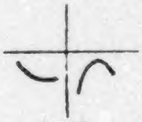
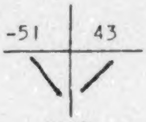
Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
268.	Teaching Strategies Should Be Teacher-Centered and Well Structured	00	 17*	 25**	00	00
269.	Believe Subject Matter is More Important Than Social-Emotional Factors	 40*	05	 32**	 40**	 48**
270.	Believe Teacher's Job Includes Helping Child to Teach Himself Along With Some Parent Duties	04	00	02	01	00
271.	Recognizes Importance of Integration of Subject Matter for Teaching Large Class	01	00	-54** 08 02	 14*	 24*
272.	Preference for and Orientation to High Achievers	 30**	 15*	 47**	 41**	 30**
273.	Instruction Time Is Low Because of Control Problems and Too Few Personnel	 23**	00	00	00	01
274.	Feel Problems Stem From Children Themselves and Their Environment	 27**	00	 29**	 36**	 26**
275.	Interested In Out-of-Classroom Aspects of Teaching	02	01	01	05	00

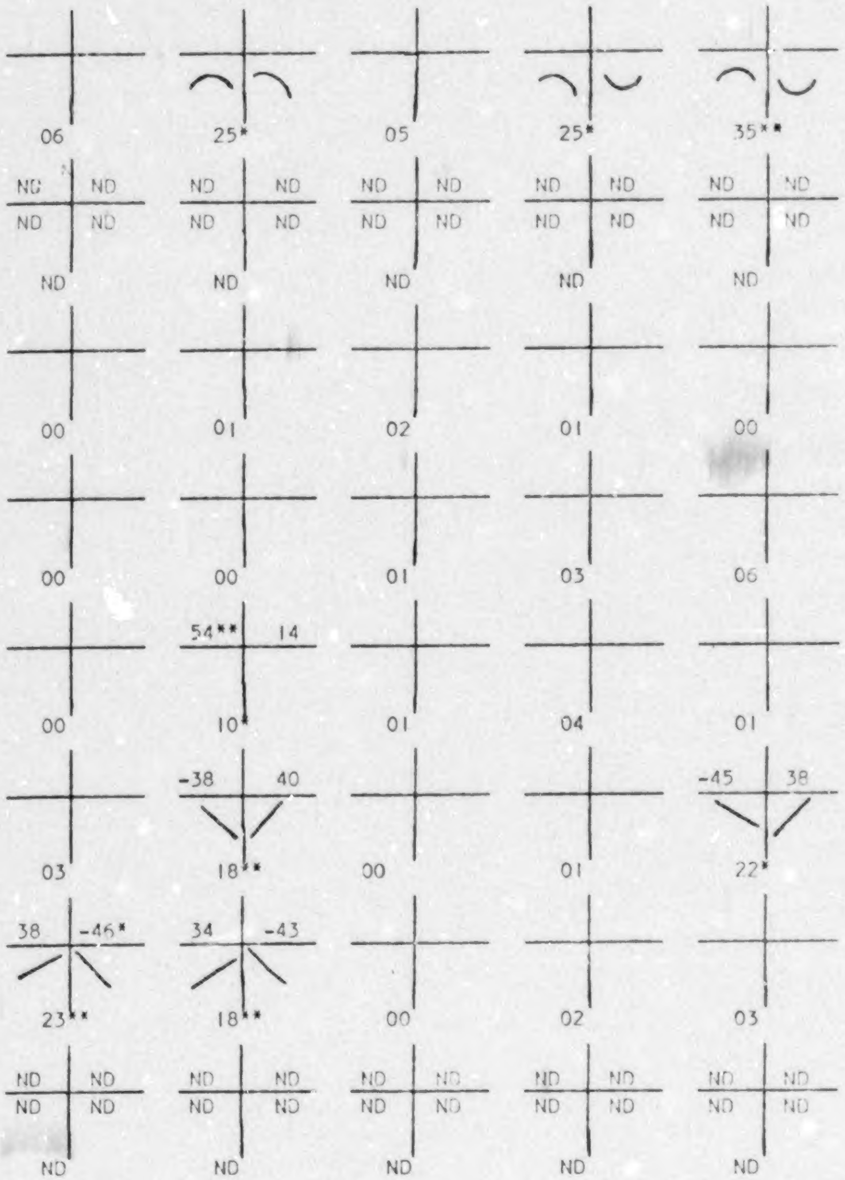
Table 9, Cont'd.

Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
276.	Use Student Conduct and Personal Qualities In Assigning Academic Grades	01	-01 49* 08	04	02	06

[1] Probability values are indicated by asterisks. One asterisk indicates a value of ≤.10; two asterisks indicate a value of ≤.05.

[2] Where dashes appear instead of correlation coefficients, variance on the item was too low to permit analyses for one or both subgroups or for the total group. In these cases subjects tended to be nearly unanimous in agreeing or disagreeing with the item. A (agree) or D (disagree) are typed in the righthand column to indicate the reason for low variance. Where ND appears but no notation is made in the column, analyses could not be run for other reasons, such as low N.

Table 10. Non-linear Presage-Product Relationships between Teacher Interview Variables (using combined scores) and Student Residual Gain Scores (averaged across four years) on the Metropolitan Achievement Tests (decimal points omitted).[1]



Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
1.	Teacher Places Restrictions On Parental Involvement	06	25*	05	25*	35**
2.	Parents Play an Important Role In Teacher-Child Rapport	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
3.	Teacher Defines Parental Cooperation By Interest In Child, Not Teacher	00	01	02	01	00
4.	School Open To Parent's Visits Without Restrictions	00	00	01	03	06
5.	Teacher Names Disadvantage of Busing In Terms of Children's Emotional Harm	00	54** 14 10*	01	04	01
6.	Teacher Names Black Students' Needs As Instructional, Not Social-Emotional	03	-38 40 18**	00	01	-45 38 22*
7.	Teacher Does Individual Reading About Education	38 -46* 23**	34 -43 18**	00	02	03
8.	Teacher Subscribes To Magazines	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 10, Cont'd.

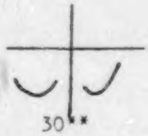
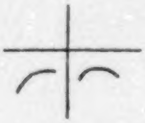
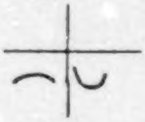
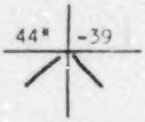
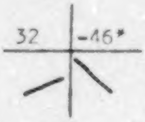
Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
9.	Teacher Relies On School Personnel For Advice About Teaching	00	03	00	00	01
10.	Teacher Uses Psychological services	02	01	02	06	03
11.	Teacher Implies She Takes Active Role In Individual Re-Teaching	14**	57** 06 07	 30**	03	06
12.	Teacher Makes Direct Effort to Respond To Motivation Problems	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
13.	Teacher Exhibits Favorable Attitude Toward Conduct Grades	 19*	53** 11 07	01	00	01
14.	Teacher Uses Own Diagnosis to Plan Teaching	04	 27**	47* -25 00	 44* -39 20**	 32 -46* 26*
15.	Teacher Uses Non-Objective Records	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
16.	Teacher Uses Her Own Judgment Based on Child's Performance (Non-Testing)	00	00	00	01	66** -23 00

Table 10, Cont'd.

Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
17.	Teacher Used Only Subjective Criterion To Judge Her Success	00	-57** 07 03	04	01	02
18.	Teacher Bases Response To A Mistake On The Child's Explanation	01	01	02	03	05
19.	Teacher Keeps Up Pace Of Class, Not Waiting, Sustaining, or Correcting	14**	68** -02 11*	00	03	05
20.	Teacher Has A Specific Approach to No Responses, Instead of Simply Waiting	00	00	03	52** 07 07	00
21.	Teacher Sustains Child Who Is Not Paying Attention	15*	02	00	00	00
22.	Teacher Sustains Student if She Gets An Incorrect Response	19*	36**	01	21*	39**
23.	Teacher Uses Special Techniques to Teach Language Arts	33**	02	-26 37 12*	01	00
24.	Limits Use of Kids At Board In Some Way	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

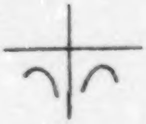
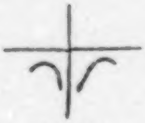
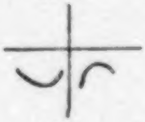
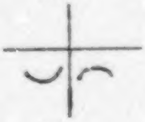
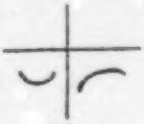
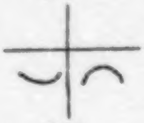
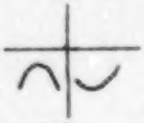
Table 10, Cont'd.

Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
25.	Use of Game Type Activities To Teach Language Arts	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
26.	Belief That Cause For Reading Failure Lies in Child	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND	ND ND ND ND
27.	Use of Non-Book Materials To Teach Reading	10*	07	00	24 -60** 25**	27 -53** 30**
28.	Teacher Arranges Student Activities Which Do Not Require Direct Supervision	⌣ ⌢ 40**	⌣ ⌢ 37**	06	07	65** 26 10
29.	Use of TV Shows	⌣ ⌢ 43**	01	⌢ ⌢ 41**	⌣ ⌢ 44**	⌣ ⌢ 72**
30.	Use of Patterned Turns in Reading Group	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND
31.	High Use of Spelling Bees	⌣ ⌣ 23*	01	07	00	01
32.	Teacher Bases Judgement of Innovations on Their Social-Emotional Effect	03 54** — / 24*	25 52** 12*	10*	01	00

Table 10, Cont'd.

Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
33.	Problems With Rapport Stem From Child	06	01	33 55** 20**	02	01
34.	Teacher Mentions Concern With Social-Emotional Needs of Mexican-American Children	-52** 02 04	-42 47* 23**	00	00	00
35.	Positive Attitudes Toward TV	02	31 55** 22**	00	00	01
36.	Judges Disadvantages of Innovations By Their Effects On Students, Rather Than Herself	03	04	07	15**	17**
37.	Reaction to AISD Curriculum Changes Was Change in Teaching	01	49* 23 11*	03	49* 30 [illegible]4**	0[illegible]
38.	Teacher Names Different Ways to Plan Lessons (Subject, Unit, Time)	-22 44 18*	00	-10 47* 18*	01	03
39.	Does Not Publicize Test Scores	01	00	08	-51** -20 11*	-71** -12 06
40.	Believes That Understanding is More Important Than Confidence In Teaching a Curriculum	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND	ND ND ND ND ND

Table 10, Cont'd.

Number	Presage Variable	Word Knowledge	Word Discrimination	Reading	Arithmetic Computation	Arithmetic Reasoning
41.	Uses a Humanistic Approach, Tries To See Child's Side	 19*	02	 25**	00	01
42.	Punishment: Use of Nonpunitive Techniques Instead of Isolation or Loss of Privilege	01	01	 16*	 17*	00
43.	Teacher Involves Kids in Determining Classroom Rules	 23*	 32**	00	05	01
44.	Most Common Discipline Problem is Noise, Not Children's Disrespect For Each Other	04	 28*	36 57** 21**	04	01

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[1] Probability values are indicated by asterisks. One asterisk indicates a value of ≤ .10; two asterisks indicate a value of ≤ .05.